

ONKYO SERVICE MANUAL

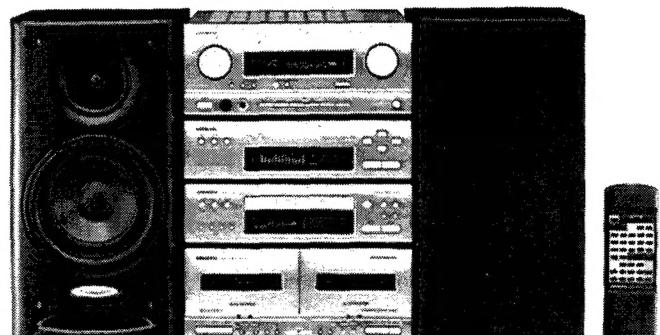
REF. NO. 3482

PERSONAL COMPONENT SYSTEM

PCS-32/PCS-22



PCS-22



PCS-32

Black and Silver models

UPV, UP	230V AC, 50Hz
UW	120 or 220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO®
AUDIO COMPONENTS

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CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc, that the components are liable to be broken down or its reliability remarkably deteriorated.

During repair,carefulley take the following precautions.
(The following precautions are included in the service parts.)

PRECAUTIONS

1.Ground for the work-desk.

Place a conductive sheet such as a sheet of copper (with impedance lower than $10M\Omega$) on the work-desk and place the set on the conductive sheet so that the chassis.

2.Grounding for the test equipment and tools.

Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

3.Grounding for the human body.

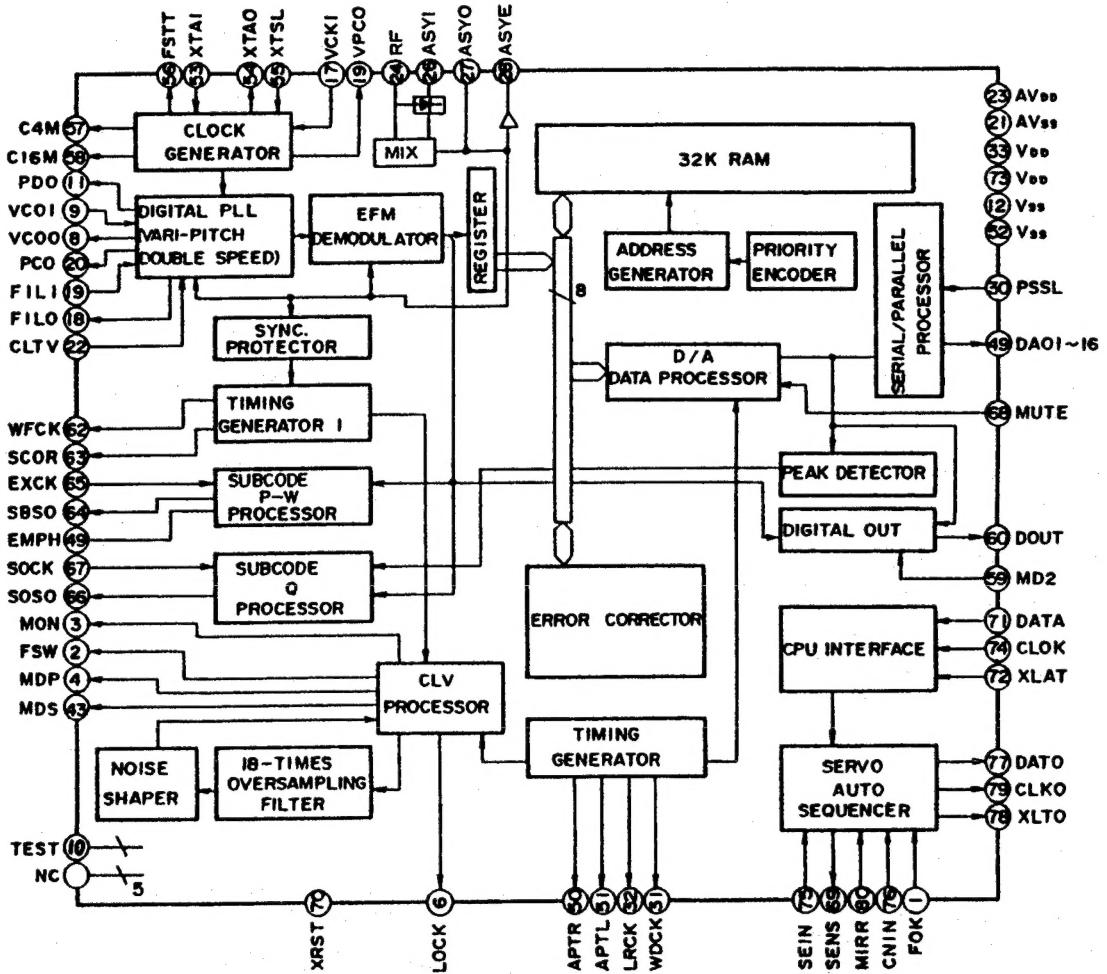
Be sure to put on a wrist-strap for grounding whose other end is grounded.
Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

4.Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

5.Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.

IC BLOCK DIAGRAMS AND DESCRIPTIONS

CXD2500AQ (Digital Signal Processor)



PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

- Material: GaAlAs
- Wavelength: 760 ~ 800 nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

*This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABELS

The label shown below are affixed.

1. Warning label

This label is located on the chassis.

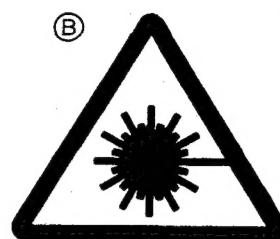
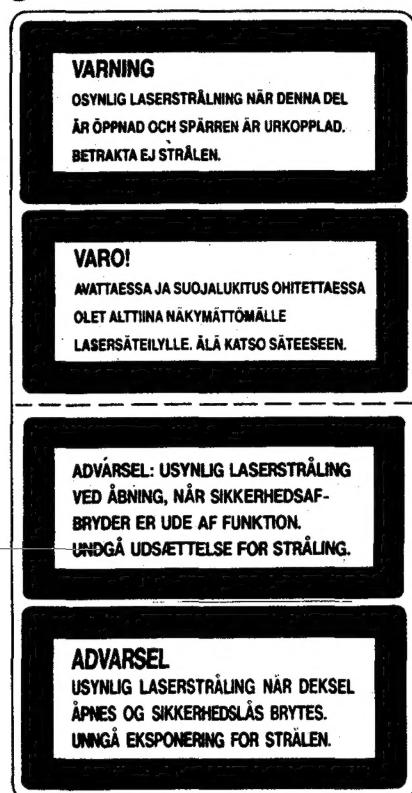
(A)

DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFECTED.

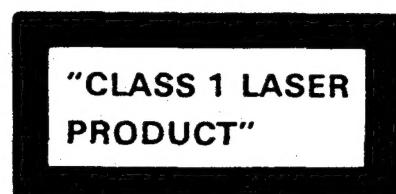
ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L' ECLENCHEMENT DE SECURITE ANNULE.

(C)



2. Class 1 label

This label is located on the left side of top cover.



LUOKAN 1
LASERLAITE
KLASS 1
LASER APPARAT

ADVARSEL

Denna mærkning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive utsat for utiladelig kraftig stråling.

APPARATET BØ/R KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLERI

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

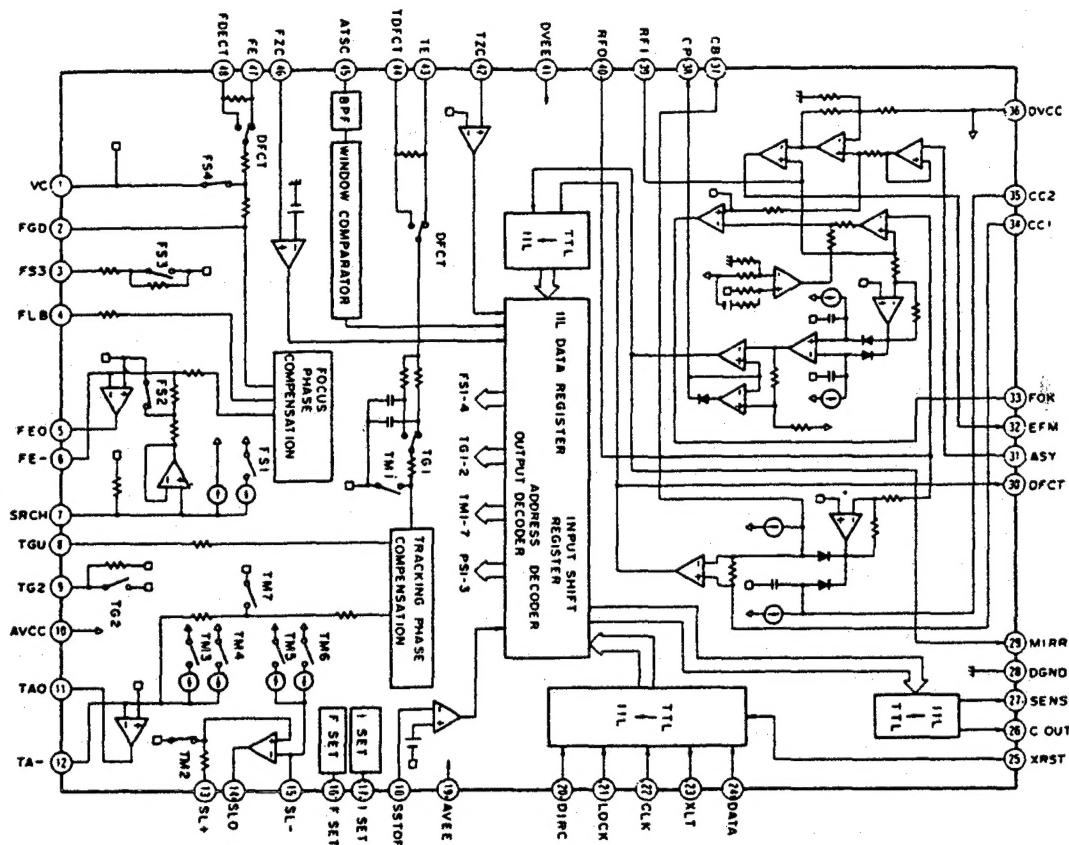
VAROITUS! LAITTEEN KÄYTÄMINEN MUULLA KUIN TÄSSÄ KAYTTOOHJEESSÄ MÄNTULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVILLE NAKYMÄTTÖMALLE LASERSÄTEILYLLE.

NO.	SYMBOL	I/O	DESCRIPTION
1	FOK	I	Foucs Ok input
2	FSW	O	Output filter changeover output for spindle motor
3	MON	O	Spindle motor control output
4	MDP	O	Spindle motor servo control
5	MDS	O	Spindle motor servo control
6	LOCK	O	H when GFS is the high level
7	NC		
8	VCOO	O	Oscillation circuit output for analog EFM PLL.
9	VCOI	I	Oscillation circuit input for analog EFM PLL. (8.6436MHz)
10	TEST	I	Test terminal
11	PDO	O	Charge pump output analog EFM PLL
12	Vss		Ground terminal
13-15	NC		
16	VPCO	O	PLL charge pump output for variable pitch
17	VCKI	I	Clock input for variable pitch from VCO (16.934MHz)
18	FILO	O	Filter output for master PLL.
19	FILI	I	Filter input for master PLL.
20	PCO	O	Charge pump output of master PLL
21	AVss		Analog ground
22	CLTV	I	VCO control voltage input for master
23	AVDD		Analog section power supply (+5V)
24	RF	I	EFM signal input
25	BIAS	I	Asymmetry circuit constant current input
26	ASYI	I	Asymmetry comparator voltage input
27	ASYO	O	EFM full swing output
28	ASYE	I	Asymmetry control circuit
29	NC		
30	PSSL	O	Audio data output mode changeover input Serial data at L and parallel data at H.
31	WDCK	I	D/A interface for 48 bits slot. Word clock f=2Fs.
32	LRCK	I	D/A interface for 48 bits slot. LR clock f=Fs.
33	VDD		Power supply terminal (+5V)
34-49			Data output terminals
		PSSL=1	PSSL=0
34	DA16	O	DA16 Serial data of 48 bits slot
35	DA15	O	DA15 Bit clock of 48 bits slot
36	DA14	O	DA14 Serial data of 64 bits slot
37	DA13	O	DA13 Bit clock of 68 bits slot
38	DA12	O	DA12 LR clock of 68 bits slot
39	DA11	O	DA11 GTOP output
40	DA10	O	DA10 XUGF output
41	DA09	O	DA09 XPLCK output

NO.	SYMBOL	I/O	DESCRIPTION
42	DA08	O	DA08 GFS output
43	DA07	O	DA07 RFCK output
44	DA06	O	DA06 C2P0 output
45	DA05	O	DA05 XRAOF output
46	DA04	O	DA04 MNT 9 output
47	DA03	O	DA03 MNT 2 output
48	DA02	O	DA02 MNT 1 output
49	DA01	O	DA01 MNT 0 output
50	APTR	O	Control output for aperture correction. H when R ch.
51	APTL	O	Control output for aperture correction. H when L ch.
52	Vss		Ground terminal
53	XTAI	I	Crystal oscillation circuit input of 16.9344MHz or 33.8688MHz input.
54	XTAO	O	Crystal oscillation circuit output of 16.9344MHz.
55	XTSL	I	Crystal selection input terminal. L when 16.9344MHz, H when 33.8688MHz.
56	FSTT	O	2/3 divided output of pins 53 and 54.
57	C4M	O	4.2336 MHz output
58	C16M	O	16.9344 MHz output
59	MD2	I	Digital output control input. On at high level.
60	DOUT	O	Digital output
61	EMPH	O	Emphasis control output. Active high.
62	WFCK	O	Write frame clock output
63	SCOR	O	Sub-code detection output. H when is detected SO or SI.
64	SBSO	O	Serial output of sub-code (P~W)
65	EXCK	I	Clock input for read out SOSO.
66	SQSO	O	Sub Q 80 bits, PCM peak, and level data 16 bits output.
67	SQCK	I	Clock input for read out SQSO
68	MUTE	O	Muting control output. Active H.
69	SENS		Sens output. Output to the microprocessor
70	XRST	I	System reset. Reset at the low level.
71	DATA	I	Serial data input from the microprocessor.
72	XLTA	I	Latch input from the microprocessor. Latch the serial data at the trailing.
73	VDD		Power supply treminal
74	CLOK	I	Serial data transfer clock input from microprocessor
75	SEIN	I	Sens input from SSP
76	CNCI	I	Track jump numbers count signal input
77	DATO	O	Serial data output to SSP
78	XLTO	O	Serial data latch output to SSP. Latch at trailing.
79	CLKO	O	Serial data transfer clock output to SSP.
80	MIRR	I	Mirror signal input

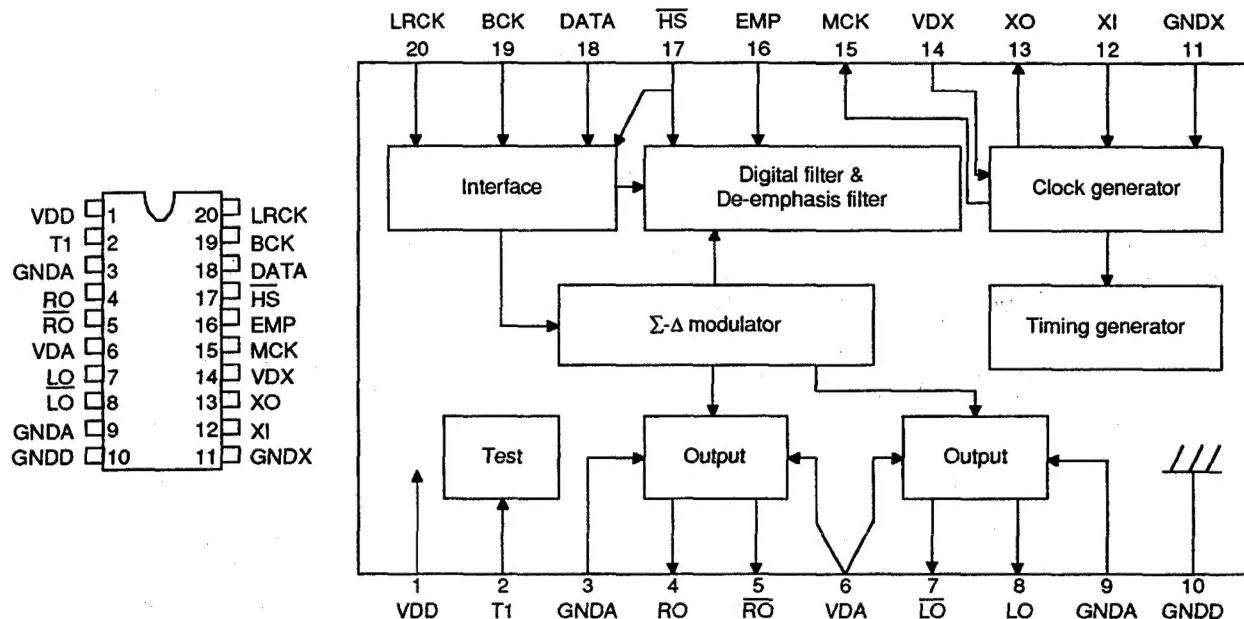
Note: SSP:IC101 CXA1372Q

CXA1372Q (Servo Signal Processor)



PIN NO.	SYMBOL	I/O	DESCRIPTION	PIN NO.	SYMBOL	I/O	DESCRIPTION
1	VC	I	Mid-point voltage input terminal.	23	XLT	I	Latch input terminal for microprocessor.
2	FGD	I	Connect the capacitor between FS3 and this pin when the high frequency gain focus servo is dropped.	24	DATA	I	Serial data input terminal for microprocessor.
3	FS3	I	Focus servo high frequency gain changeover input terminal.	25	XRST	I	Reset input terminal. Active low.
4	FLB	I	Input terminal for the low frequency boost of focus servo.	26	C.OUT	O	Signal output to count the track numbers.
5	FEO	O	Focus drive output terminal.	27	SENS	O	This terminal outputs FZC, and SSTOP to according command from the microprocessor.
6	FE-	I	Inversion input terminal of focus amplifier.	29	MIRR	O	Mirror comparator output terminal.
7	SRCH	I	Time constant terminal to make the focus search waveform.	30	DFCT	O	Defect comparator output terminal.
8	TGU	I	Tracking high frequency changeover input terminal.	31	ASY	I	Auto asymmetry control input terminal.
11	TAO	O	Tracking drive output terminal.	32	EPM	O	EFM comparator output terminal.
12	TA-	I	Inversion input terminal of tracking amplifier.	33	FOK	O	Focus OK comparator output terminal.
13	SL+	I	No-inversion input terminal of sled amplifier.	34	CC1	O	Defect bottom hold output terminal.
14	SLO	O	Sled drive output terminal.	35	CC2	I	Defect bottom hold input terminal from CC1.
15	SL-	I	Inversion input terminal of sled amplifier.	37	CB	I	Defect bottom hold capacitor connection terminal.
16	ISET	I	Peak setting input of phase correction of focus tracking.	38	CP	I	Mirror hold capacitor connection terminal.
17	ISET	I	This terminal is flowed the current so that the focus search, tracking jump, and sled kick height is decided.	39	RF1	I	RF summing amplifier input terminal.
18	SSTOP	I	Inner switch selection input terminal.	40	RFO	O	RF summing amplifier output terminal.
20	DIRC	I	This terminal is used when track jump.	42	TZC	I	Tracking zero-cross comparator input terminal.
21	LOCK	I	The sled runaway prevention circuit operates at the low level.	43	TE	I	Tracking error input terminal.
22	CLK	I	Serial data transfer clock input from microprocessor.	44	TDFCT	I	Capacitor connection terminal for time constant when defect.
				45	ATSC	I	Window comparator input terminal for ATSC detection.
				46	FZC	I	Focus zero-cross comparator input terminal.
				47	FE	I	Focus error input terminal.
				48	DFDCT	I	Capacitor connection terminal for time constant when defect.

TC9268P (D/A Convertor)



NO.	SYMBOL	I/C	DESCRIPTION
1	VDD		Voltage supply terminal for digital.
2	T1	I	Test terminal. "L" when normally
3	GNDA		Ground terminal for R-ch analog.
4	RO	O	Output terminal for R-ch positive signal.
5	RŌ	O	Output terminal for R-ch negative signal.
6	VDA		Voltage supply terminal for analog.
7	LO	O	Output terminal for L-ch negative signal.
8	LŌ	O	Output terminal for L-ch positive signal.
9	GNDA		Ground terminal for L-ch analog.
10	GNDD		Ground terminal for digital
11	GNDX		Ground terminal for system clock oscillation.
12	XI	I	Ceramic resonator connection terminal for the system clock.
13	XO	O	
14	VDX		Voltage supply terminal for ceramic resonator.
15	MCK	O	Output terminal for system clock.
16	EMP	I	De-emphasis control input.
17	HS	I	Setting the speed of action. "H"when normal, "L"when double speed.
18	DATA	I	Input terminal for DATA.
19	BCK	I	Input terminal of bit clock.
20	LRCK	I	Input terminal of LR clock.

PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5025-1)					
CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
		ICs			Capacitors
Q101	22240791	HD6433713A45H	C903,C904	393344727	4700 μ F,16V,Elect.
Q201	22240487 or	CXD2500AQ or	C905	374721044	0.1 μ F \pm 5%,50V,Plastic
	22240487A	CXD2500BQ	C907	393381097	0.1 μ F,50V,Elect.
Q202	24120038	GP1F32T,Opto. module	C909	393324717	470 μ F,6.3V,Elect.
Q301	22240792	TC9268P	C911	374721034	0.01 μ F \pm 5%,50V,Plastic
Q401,Q402	22240191	NJM4565D-D	C921	393321027	1000 μ F,6.3V,Elect.
Q901	780055JRC	78M05	C922	374722224	2200pF \pm 5%,50V,Plastic
Q902	22240018	M518943ASL	C931	393344707	47 μ F,16V,Elect.
Q931	222780075MIT	M5F78M07L	C932	374721034	0.01 μ F \pm 5%,50V,Plastic
		Transistors	C941,C942	393342217	220 μ F,16V,Elect.
Q102	221281 or	DTC114YS or	C943	393381017	100 μ F,50V,Elect.
	2214930 or	UM4214 or	C951,C952	393361017	100 μ F,35V,Elect.
	2213570	RN1207			Resistors
Q103, Q104	2212600	DTA124ES	R971,R972	452534794	0.47 Ω ,1/2W,Meatl
Q411,Q412	2212794	2SD1468-R			Sockets
Q911,Q912	2211164	2SC2120-Y	P101	25050967	NSCT-27P754
Q921	2211255 or	2SC1815-GR or	P102	25050962 or	NSCT-22P749 or
	2214915	2PC1815-GR		25050894	NSCT-22P649
Q922	2211504	2SA950-Y	P103	25051247	NSCT-15P1037
		Diodes			
D101,D102	223163 or	1SS133 or	DISPLAY CIRCUIT PC BOARD (NADIS-5026-1)		
D104	223222	WG713A	CIRCUIT NO.	PART NO.	DESCRIPTION
D103	224450562	MTZ5.6B	Q701	212124	6-BT-187GK,FL tube
D901-D904	22380032 or	1SR139-100 or	S701-S714	25035652	NPS-111-S604,Push switch
D912,D913	22380035	GP104003E	P701	25050933 or	NSCT-27P720 or
D941-D943				25050724	NSCT-27P507
D911	224450823	MTZ8.2C		27190929	Holder, FL
		Resonators			
X101	3010190	CST8.00MTW, Cera lock	MECHANISM PC BOARD		
X301	3010112	KD6586FFB, X'tal	CIRCUIT NO.	PART NO.	DESCRIPTION
		Capacitors	IC101	24840089	CXA1372AQ,IC
C101	374724734	0.047 μ F \pm 5%,50V,Plastic	IC102	22240551	LA6532M-T1,IC
C102	374721524	1500pF \pm 5%,50V,Plastic	IC103	22240101	M54641L,IC
C103	374721034	0.01 μ F \pm 5%,50V,Plastic	RV101,102	24840085	10K,Trim resistor
C205, C208	393321017	100 μ F,6.3V,Elect.	SW101	24840070	Leafswitch
C211	393344707	47 μ F,16V,Elect.	CN101	24840072	Connector pin
C303	393322217	220 μ F,6.3V,Elect.	CN102	24840071	Connector socket
C304	374721044	0.1 μ F \pm 5%,50V,Plastic			
C305	393324717	470 μ F,6.3V,Elect.			
C411,C412	374721024	1000pF \pm 5%,50V,Plastic			
C413,C414	374724724	4700pF \pm 5%,50V,Plastic			
C415,C416	370136814	680pF \pm 5%,100V,Plastic			
C417,C418	393382207	22 μ F,50V,Elect.			
C421,C422	374721024	1000pF \pm 5%,50V,Plastic			
C431-C434	393342217	220 μ F,16V,Elect.			
C901,C902	374721044	0.1 μ F \pm 5%,50V,Plastic			

HD6433713A45H (Microprocessor)

No.	Symbol	I/O	Description
1	AVCC	I	Voltage supply terminal for analog
2	ADD4		Not used
3	ADD3		
4	SENS	I	Sense signal from signal processing IC
5	FOK	I	Focus OK signal
6	AD0	I	A/D port for key input
7	AD1	I	
8	NC		Not used
9	GND		
10	AVSS	I	Reference voltage supply terminal for analog
11	TEST		Not used
12	X1		
13	X2		
14	VSS	I	
15	OSC1	I	System clock oscillation input
16	OSC2	O	System clock oscillation output
17	RSTN	I	Reset input terminal
18	REMO	I	Remote control signal input port
19	SCOR	I	Synchronizing signal detector of sub code sink
20	POW	O	Power supply control output
21	NRSCO	O	NRSC output
22	NRSCI	I	NRSC input
23	P1		
24	P2		
25	P3		
26	P4		
27	P5		
28	P6		
29	P7		
30	P8		
31	P9		
32	P10		

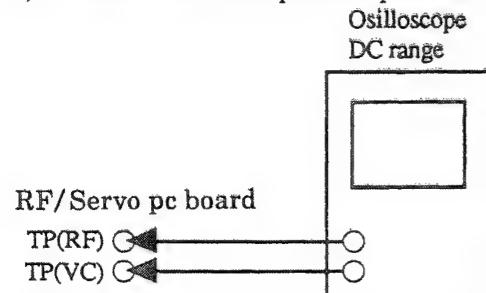
No.	Symbol	I/O	Description
33	P11		
34	P12		
35	P13	O	Segment output for fluorescent indicator tube
36	P14		
37	P15		
38	P16		
39	VDISP	I	Negative voltage for FL tube
40	6Q		
41	5Q		
42	4Q	O	Digit output terminals for fluorescent indicator tube
43	3Q		
44	2Q		
45	1Q		
46	FLON/OFF	O	FL tube ON/OFF output
47	XRST	O	Reset signal
48	STBY		Not used
49	NC		
50	OUTSW	I	Tray open operation completion signal
51	INSW	I	Tray close operation completion signal
52	OPEN	O	Tray open/close control output
53	CLOSE	O	Tray open/close control input
54	LSR	O	Laser control output
55	DFCT	O	Defect control output terminal
56	VCC	I	Power supply terminal
57	MD2	O	Inhibiting signal of digital output
58	CLK	O	Serial transfer clock output terminal of command to the signal processor IC
59	XLT	O	Command to signal processing IC
60	DATA	O	Serial data of command of signal processing IC
61	SQCK	O	Serial transfer clock of sub code Q to signal processing IC
62	SQSO	I	Serial transfer data of sub code Q from signal processing IC
63	DMUT	O	Muting signal to signal processing IC
64	AMUT	O	Muting signal

ADJUSTMENT PROCEDURES

It is not necessary to perform the adjustment of optical pickup.

This confirmation should be made when replacing the optical pickup.

- 1). Connect the oscilloscope to test points RF and VC.

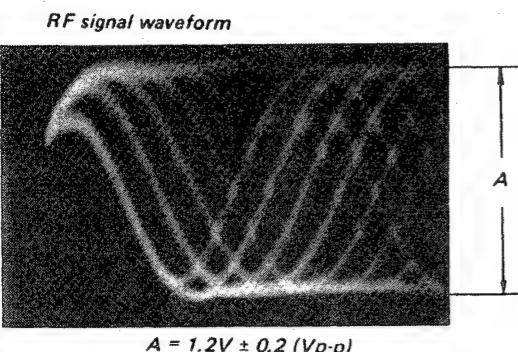


- 2). Turn the power switch on.

- 3). Load the test disc YEDS-18 on the tray and press the play button.

- 4). Confirm that the waveform on the oscilloscope is optimum eye pattern and optimum level as shown photo 1.

Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.



REFERENCE

Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

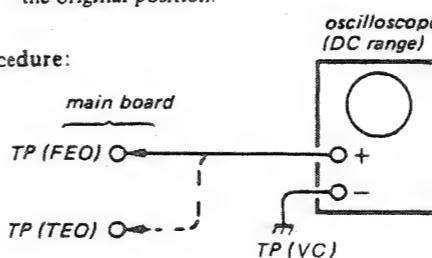
Symptoms	Gain	Focus	Tracking
• The time until music starts becomes longer for STOP → ▶PLAY or automatic selection (◀▶ buttons pressed. (Normally takes about 2 seconds.)	low	low or high	low or high
• Music does not start and disc continues to rotate for STOP → ▶PLAY or automatic selection (◀▶ buttons pressed.)	-	-	low
• Sound is interrupted during PLAY. Or time counter display stops progressing.	-	-	low
• More noise during 2-axis device operation.	high	high	high

The following is a simple adjustment method.

Simple Adjustment

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

Procedure:

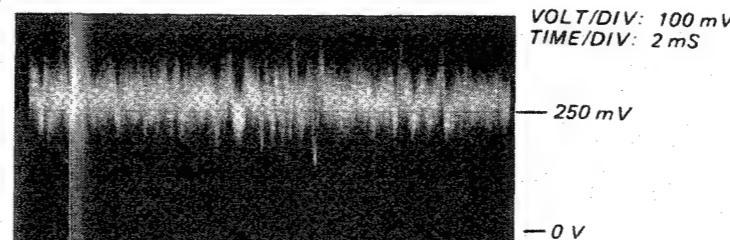


- 1). Keep the set horizontal.
If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.
- 2). Insert disc (YEDS-18) and press ▶PLAY button.
- 3). Connect oscilloscope to RF/Servo board TP(FE).
- 4). Adjust RV102 so that the waveform is as shown in the figure below. (focus gain adjustment)

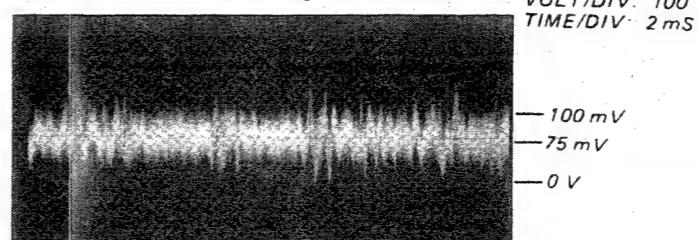


- Incorrect Examples (DC level changes more than on adjusted waveform)

low focus gain

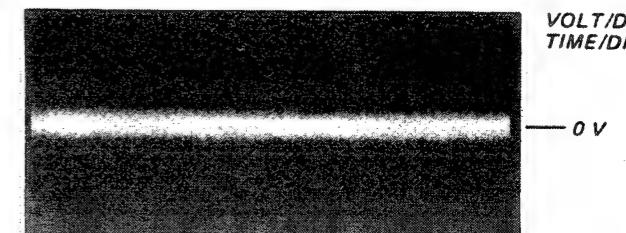


high focus gain



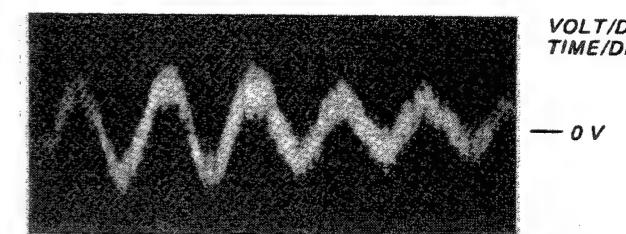
- 5). Connect oscilloscope to RF/Servo board TP(TE).

- 6). Adjust RV101 so that the waveform is as shown in the figure below. (tracking gain adjustment)

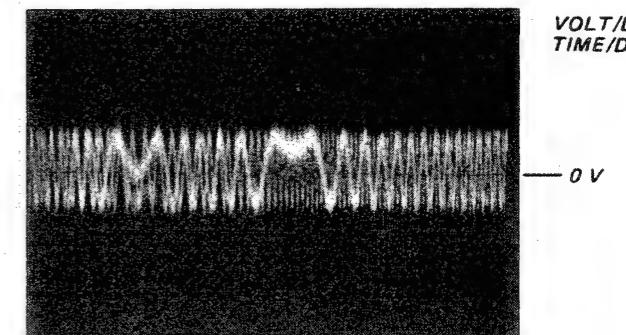


- Incorrect Examples (fundamental wave appears)

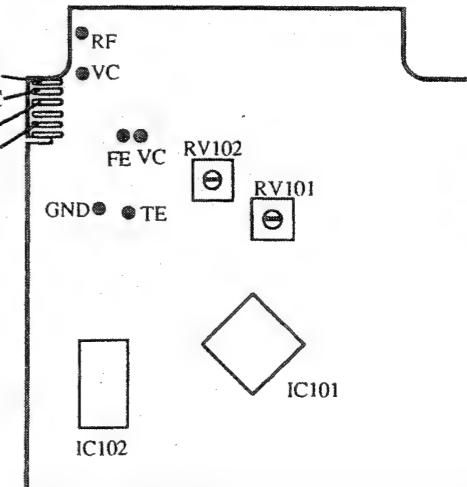
low tracking gain



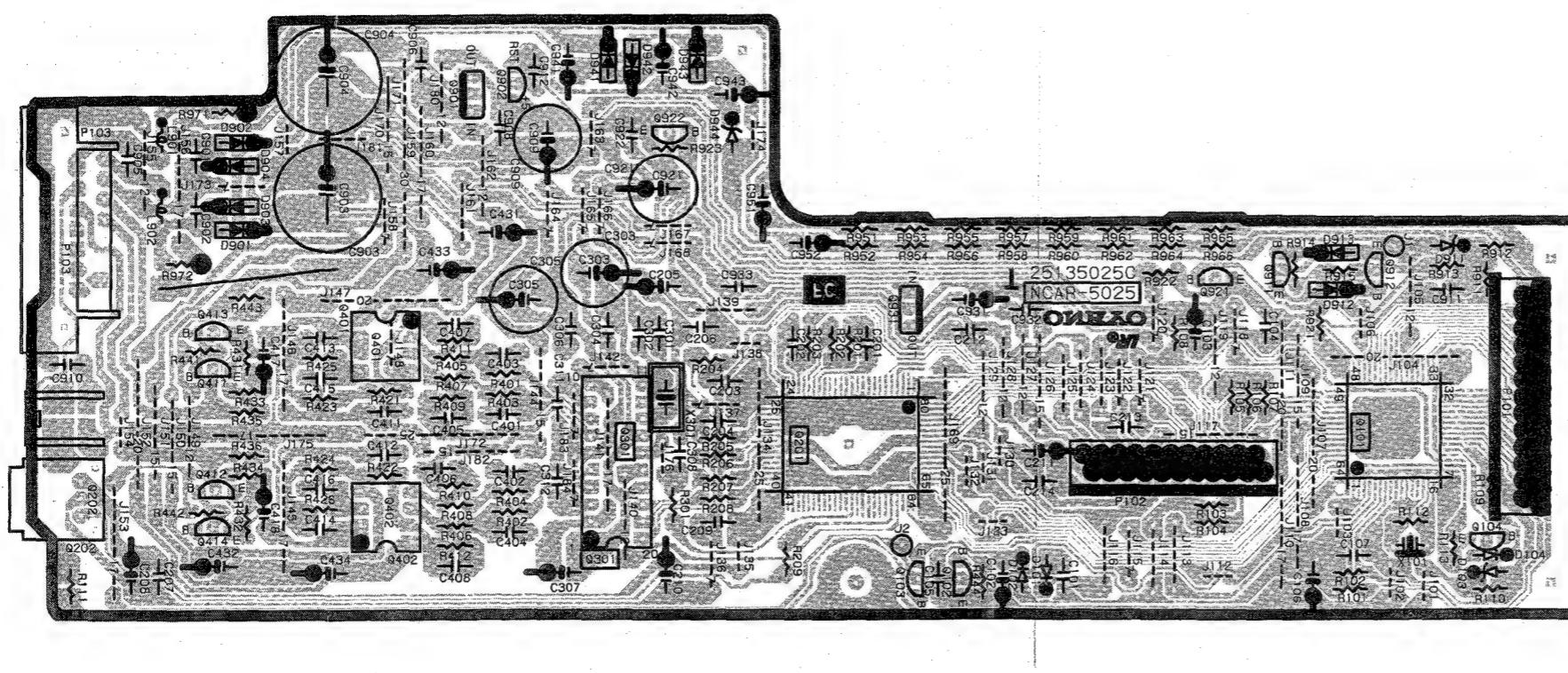
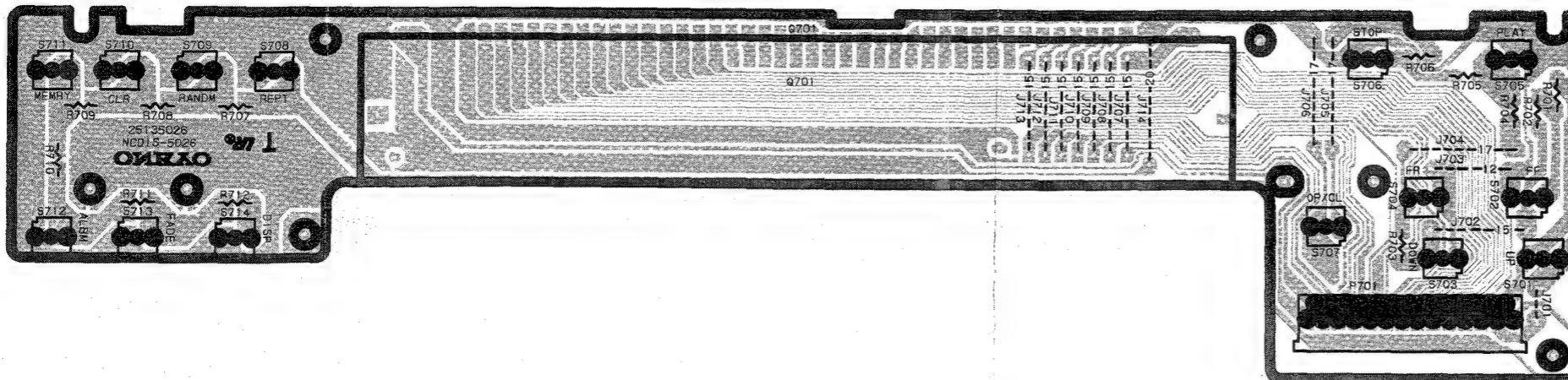
high tracking gain
(higher fundamental wave than for low gain)



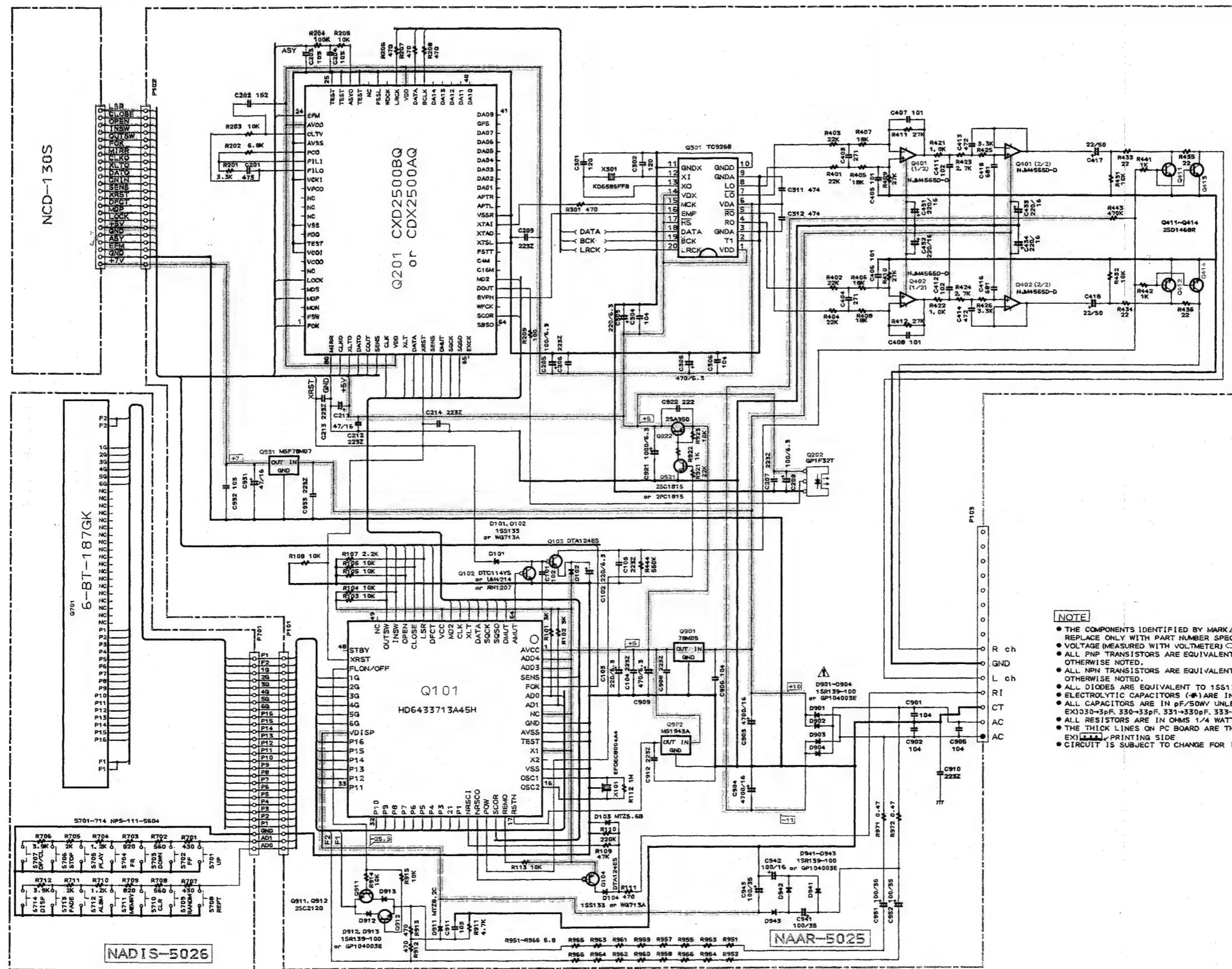
Adjustment Location: RF/Servo board



PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

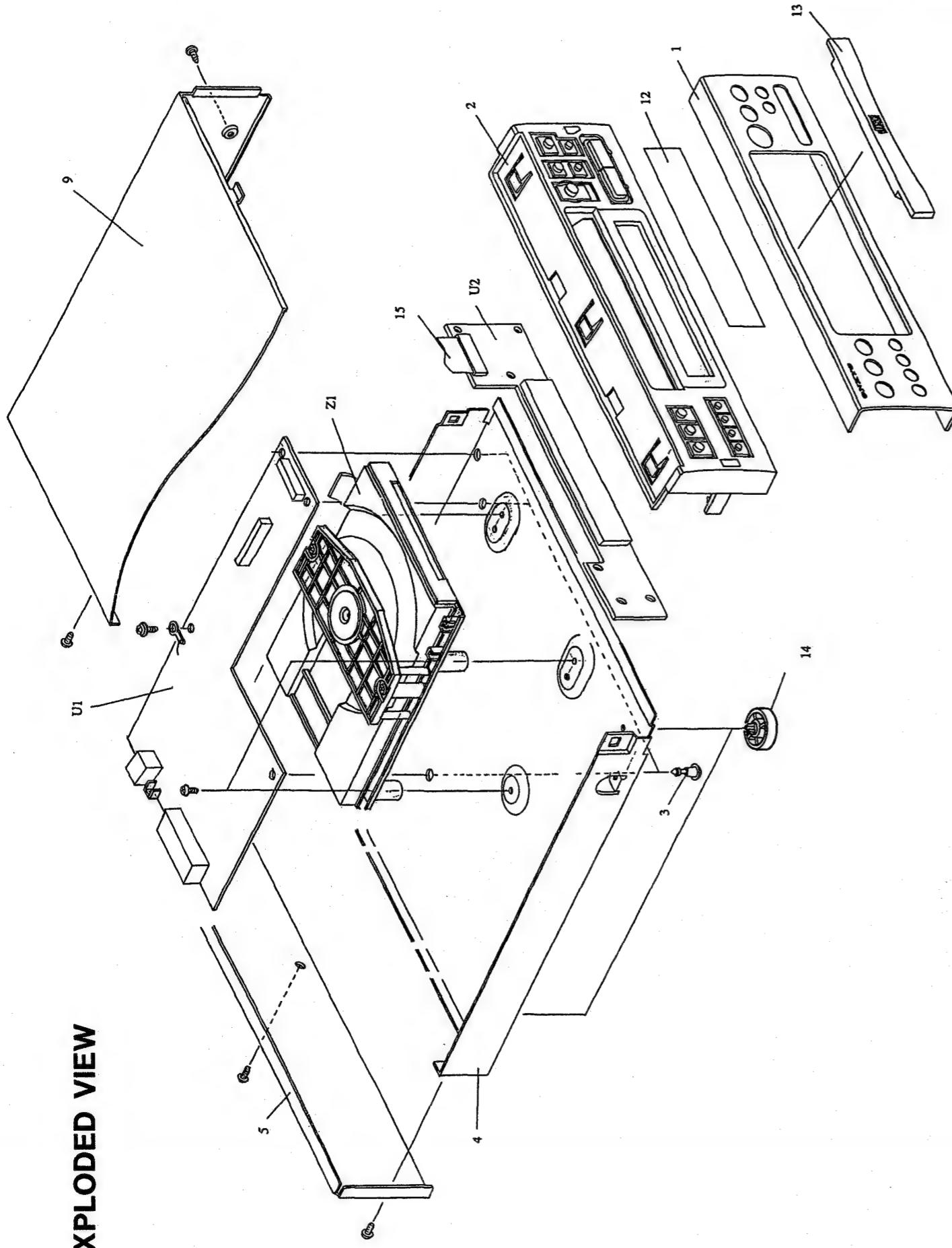


SCHEMATIC DIAGRAM



ONKYO CORPORATION

EXPLODED VIEW



C-32 C-32

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	272111611A 272111610A	Front panel, B Front panel, S
2	27110807	Front bracket, B Front bracket, S
3	27190428A	Holder, KGLS-10RF
4	27100273-1B	Chassis
5	27121891A	Rear panel
9	28184544	Cover, B
	28184545-1	Cover, S
12	28191682	Clear plate
13	28148295	Door, B
13	28148294	Door, S
14	27175299A	Leg a'ssy
15	2047271012	NCFCT7-271012, Flexible flat cable
16	2046221012	NCFCC6-221012, Flexible flat cable
U1	1H244525-1	NAAR-5025-1, Main pc board a'ssy
U2	1H244526-1	NADIS-5026-1, Display pc board a'ssy
Z1	24800009C	NCD-130S, Mecha a'ssy

REMOVAL OF TRAY ASS'Y

- Remove the top cover.
- Turn the locked screw to the clockwise to release the lock of gear.(Refer fig.1)
- Pull out the tray ass'y.
- Remove the stopper.(Refer fig.2)
- Press the tray stopper to the arrow mark direction and remove the tray ass'y.

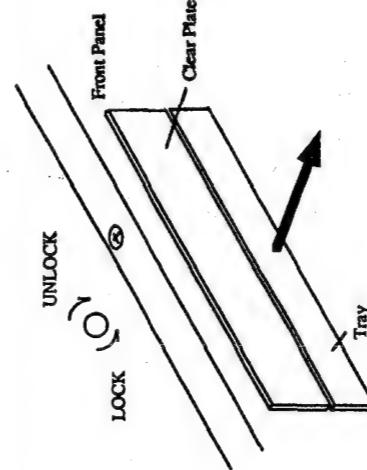


fig.1

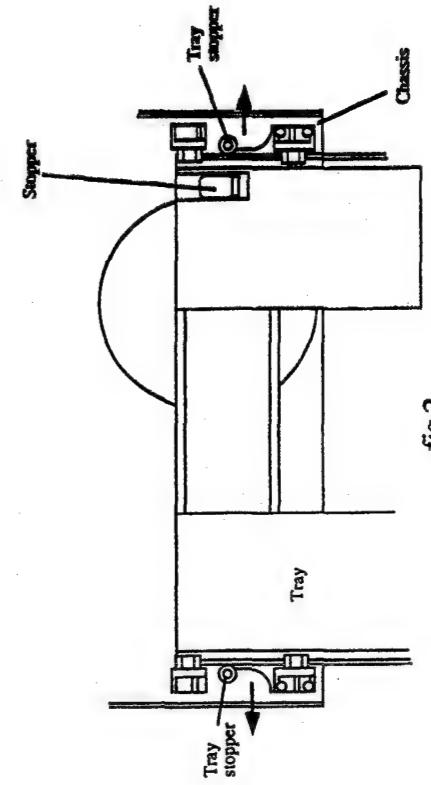
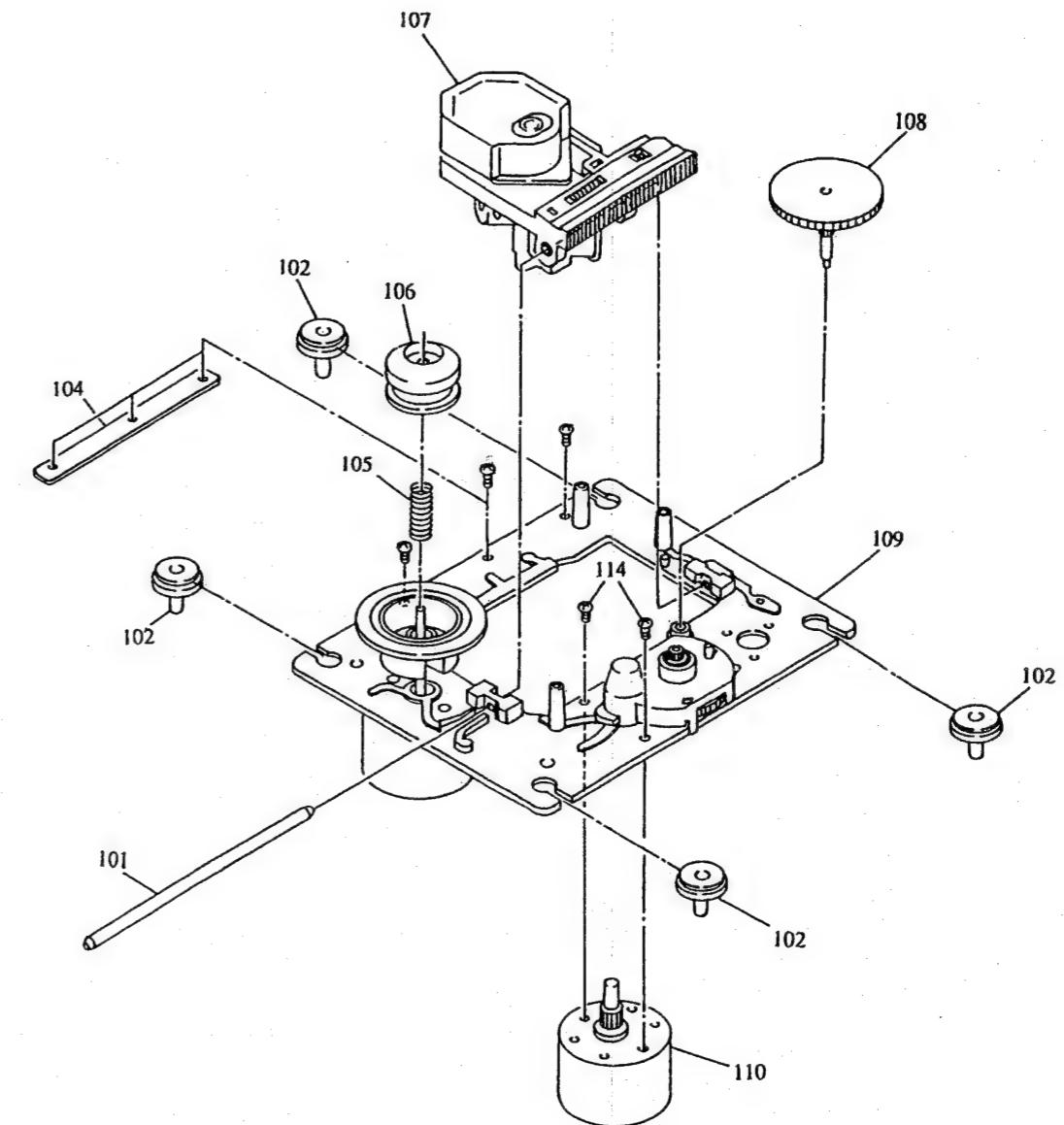
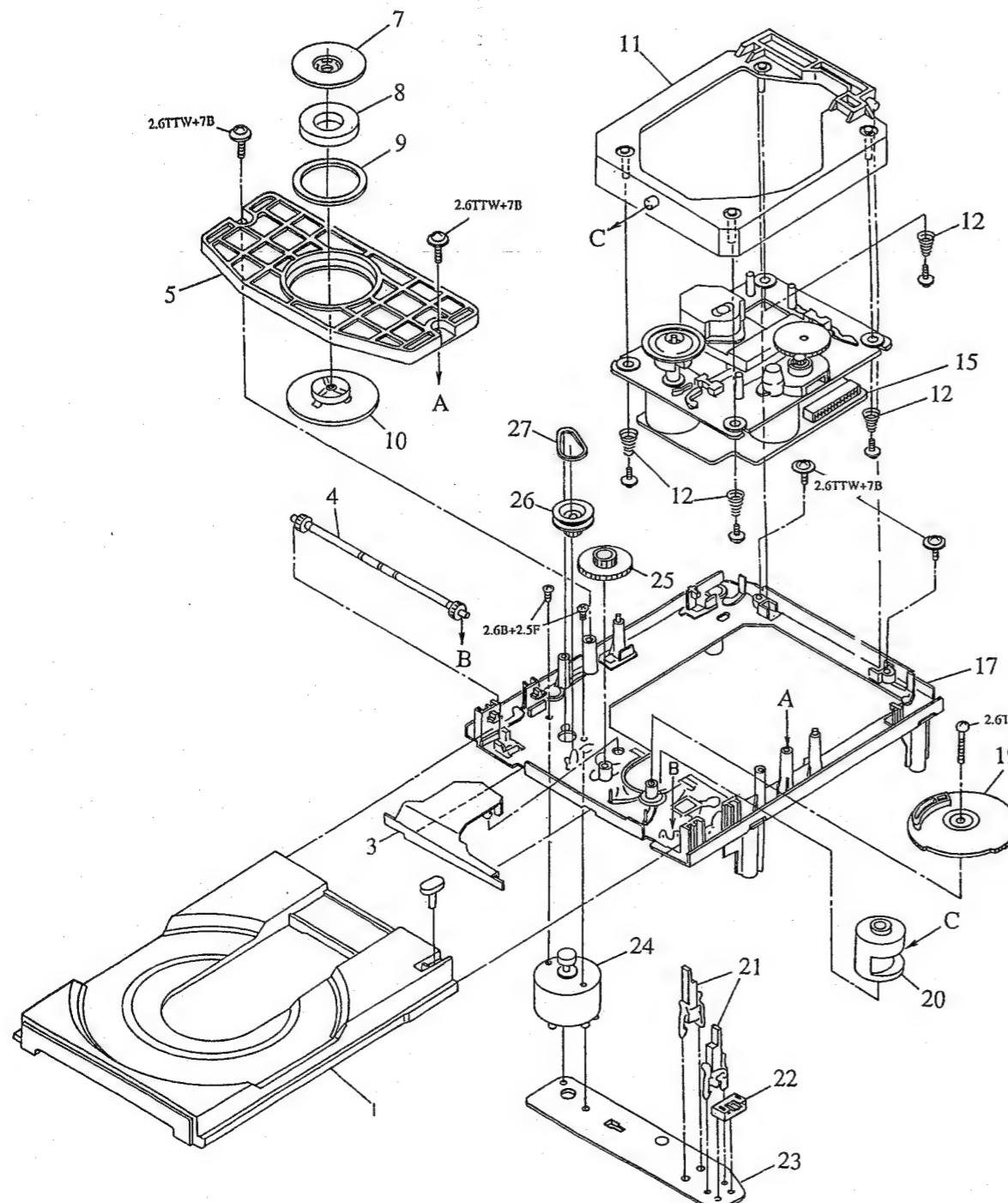


fig.2

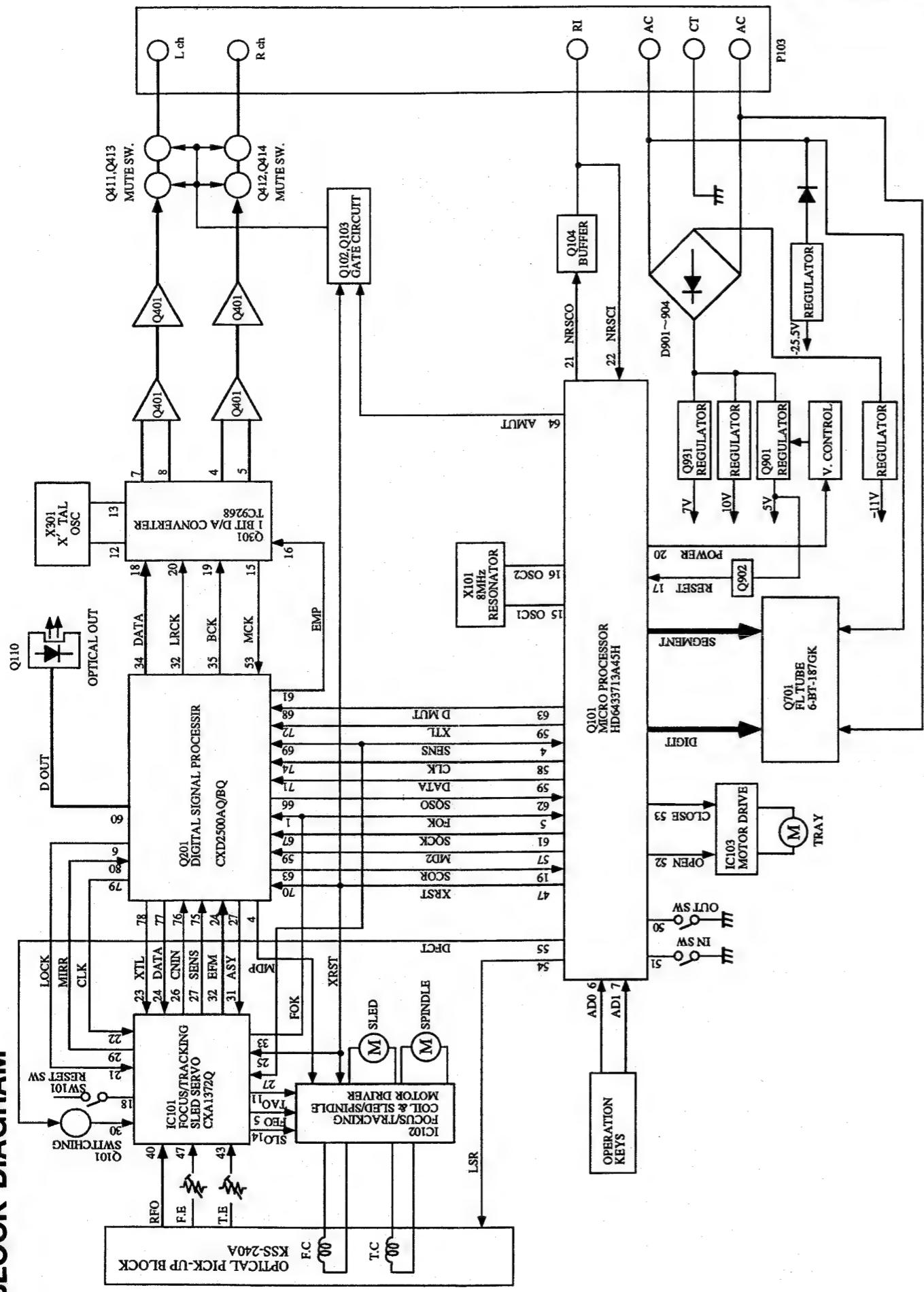
MECHANISM-EXPLODED VIEW



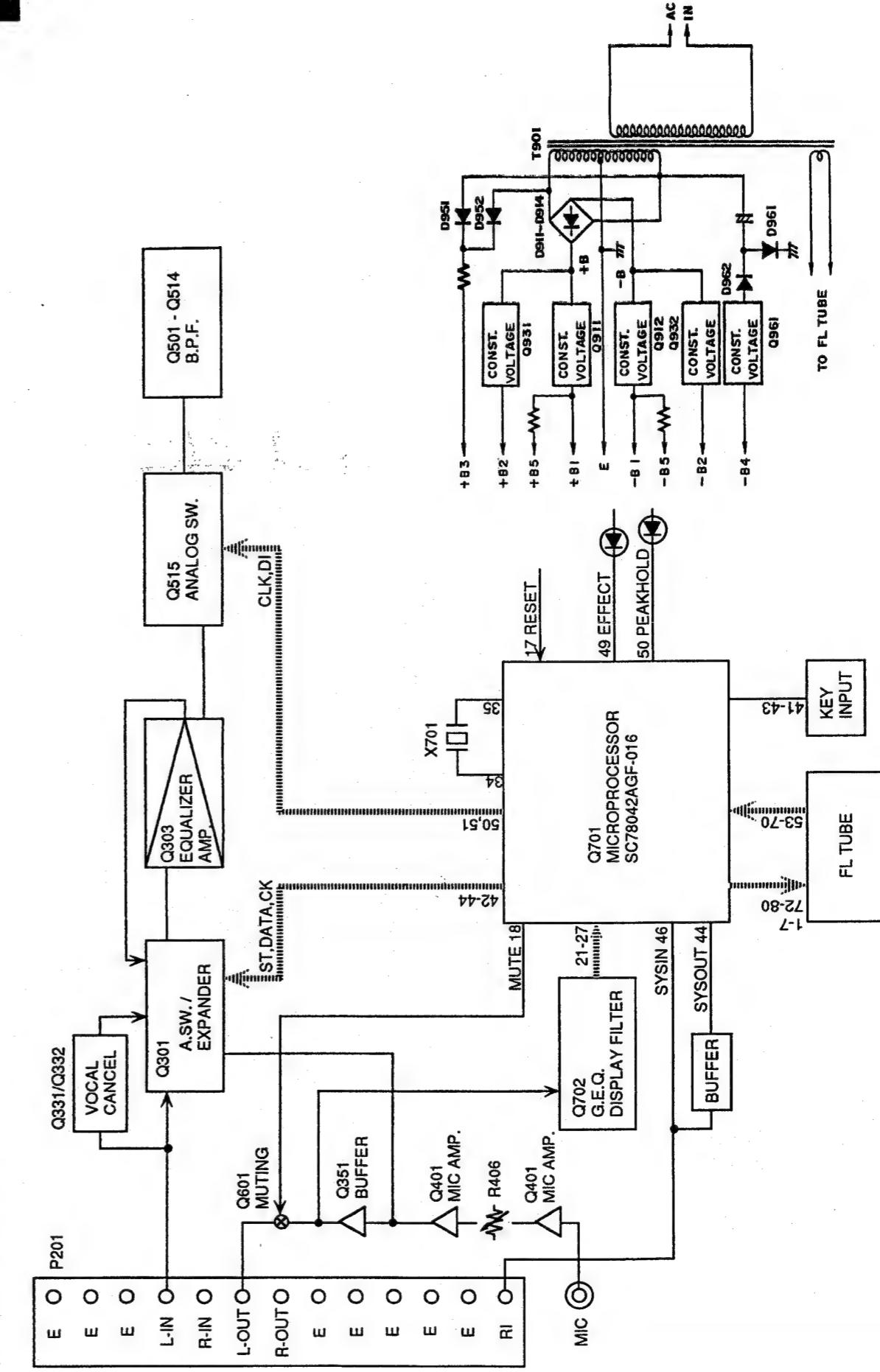
PARTS LIST

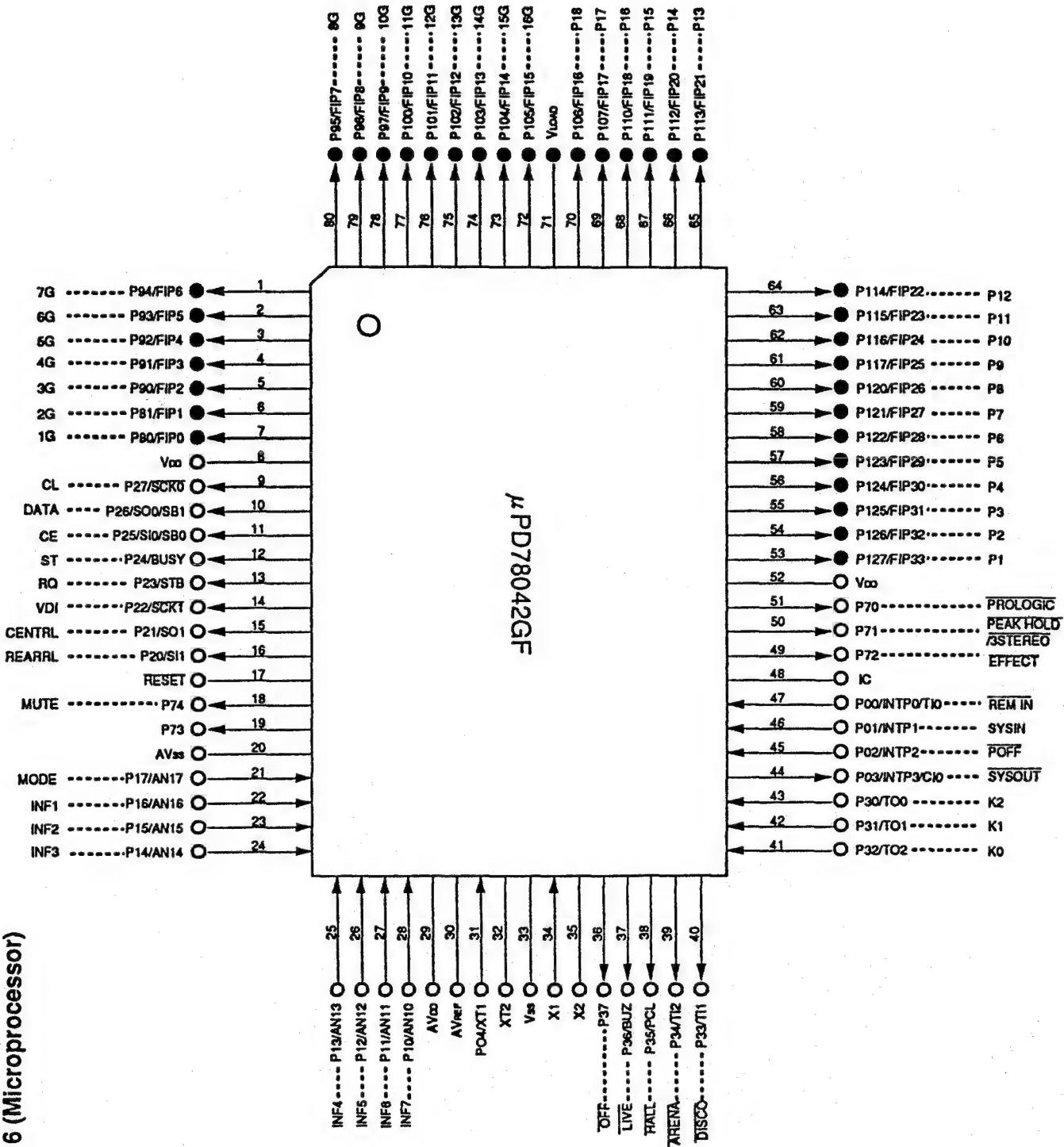
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24840053	Tray	22	25055369	NPLG-5P352,Plug
3	24822014	Gear cover	23	24840066	Loading motor pc board
4	24810020	Tray gear	24	24840067	Loading motor
5	24840061	Chucking plate	25	24810022	Middle gear
7	24830003	Chucking yoke	26	24810025	Loading plate
8	24832004	Magnet	27	24816008	Belt
9	24836013	Damper	101	24828006	Sled shaft S
10	24810024	Chucking plate	102	24836014	Insulator S
11	24802012	Sub-chassis	104	24822015	Plate S
12	24820023	Spring	105	24820024	Spring
15	24840075	CD servo pcb ass'y	106	24824003	Center ring
17	24802013	Main chassis	107	24110011	KSS-240A,Optical pickup
19	24810021	Drive gear	108	24810023	Wheel
20	24840063	Control cam	109	24802014	Chassis
21	24840064	Leafswitch	110	24804012	Motor gear

BLOCK DIAGRAM



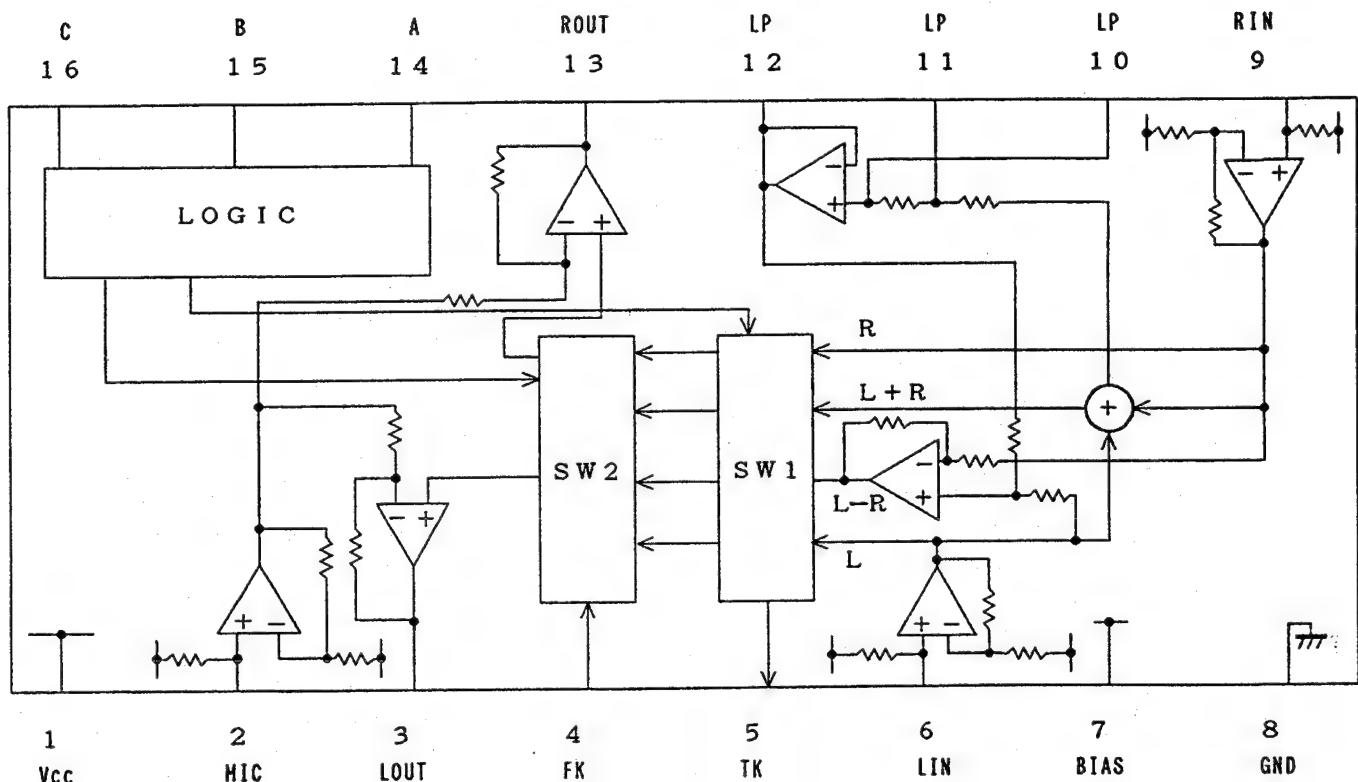
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BLOCK DIAGRAMS AND DESCRIPTIONS

BA3837



A #14	B #15	C #16	LOUT #3	ROUT #13	TK #5
L	L	L	MUTE	MUTE	MUTE
L	L	H	VF	VF	VF
L	H	L	L	L	L
L	H	H	L	R	L
H	L	L	MUTE	MUTE	MUTE
H	L	H	KC	KC	VF
H	H	L	KC	KC	L
H	H	H	KC	KC	L+R

L : 0V
H : 5V

VF : VOCAL FADE OUTPUT
KC : SIGNAL THROUGH KEY CONTROLLER

PRINTED CIRCUIT BOARD-PARTS LIST

Main circuit pc board assy(NAAF-5034-1,-1A)

CIRCUIT NO. PART NO. DESCRIPTION

	ICs	
Q301	222407956 or 22240798	NJU7311AL or TC9162AN
Q303, Q304, Q331*, Q351	22240293 or 22240247	NJM4558L-D or BA15218N
Q401*		
Q332*	22240801	BA3837
Q515	22240219	LC7522
Q911	222780125	78M12HF
Q912	222790125	79M12HF
Q931	222780565JRC	78M56
Q932	222790053	79L05
	Transistors	
Q501 - Q514	2213284	2SC1740S-R
Q601, 602	2213631 or 2213632	RN1241-A or RN1241-B
Q603	2213510 or 2214350	DTA114ES or RN2202
Q961	2213354	2SA933S-R
	Diodes	
D331*, D341, D342, D501, D601	223205 or 223163	1SS270A or 1SS133
D911 - D914, D951, D952, D961, D962 D941, D942, D964	22380046 or 22380035	AM01Z or GP1040003E
D963	224453004	MTZ6.8C
	Resistors	
R406*	5104343	N09RL50KB15M
R913, 914	441622204F	RS1WBJ22
R931, 932	441621014F	RS1WBJ100
R951	442522224F	RS1/2WBJ2.2K
R952	441621024F	RS1WBJ1K
R953	442521024F	RS1/2WBJ1K
R962	442522204F	RS1/2WBJ22
	Capacitors	
C309, C310	374726824	ECQ-B50V682J, TF C
C345-346*	374721024	ECQ-B50V102J, TF C
C401-402*	374721034	ECQ-B50V103J, TF C
C503, C504	374725634	ECQ-V50V563J, TF C
C507, C508	374724734	ECQ-V50V473J, TF C
C511, C512	374722234	ECQ-B50V223J, TF C
C513, C514	374726834	ECQ-V50V683J, TF C
C515, C516	374728224	ECQ-B50V822J, TF C
C517, C518	374722734	ECQ-V50V273J, TF C
C519, C520	374723324	ECQ-B50V332J, TF C
C521, C522	374721034	ECQ-B50V103J, TF C
C523, C524	374721524	ECQ-B50V152J, TF C
C525, C526	374723924	ECQ-B50V392J, TF C
C527, C528	374725615	ECQ-B50V561K, TF C
C915, 916	354762229S	CE04W35V2200M, ELECT C
	Terminals	
P701a	25051046	NSCT-10P833
P702a	25051045	NSCT-9P832
	Jack	
P401*	25045372	LGS6517-0202

Display circuit pc board assy(NADG-5035-1,-1A)

CIRCUIT NO. PART NO. DESCRIPTION

	ICs	
Q701	22240802	μ PD78042GF-016
Q702	22240711	XR1091ECP
	Transistors	
Q703, 704	2213560 or 221282	RN1204 or DTC114ES
	FL tube	
Q705	212134	BJ272GK
	Diodes	
D701 - D706,	223205 or	1SS270A or
D711 - D714	223163	1SS133
D707	224450562	MTZ5.6B
D721	225292D	SEL4310G-D
D722	225291D	SEL4910D-D
X701	3010163	CST4.19MGW
	Coils	
L711, L712	233411K220	NCH-1387
	Capacitor	
C701	3000076 or 3000078	EECS5R5T104 or DX-5R5L104
	Switches	
S701 - S710	25035652	NPS-111-S604
S711*		Terminals
P701b	25055659	NPLG-10P615
P702b	25055658	NPLG-9P614

Voltage switch pc board assy(NASW-5037-1)

S902 25065437 NSS-22157P

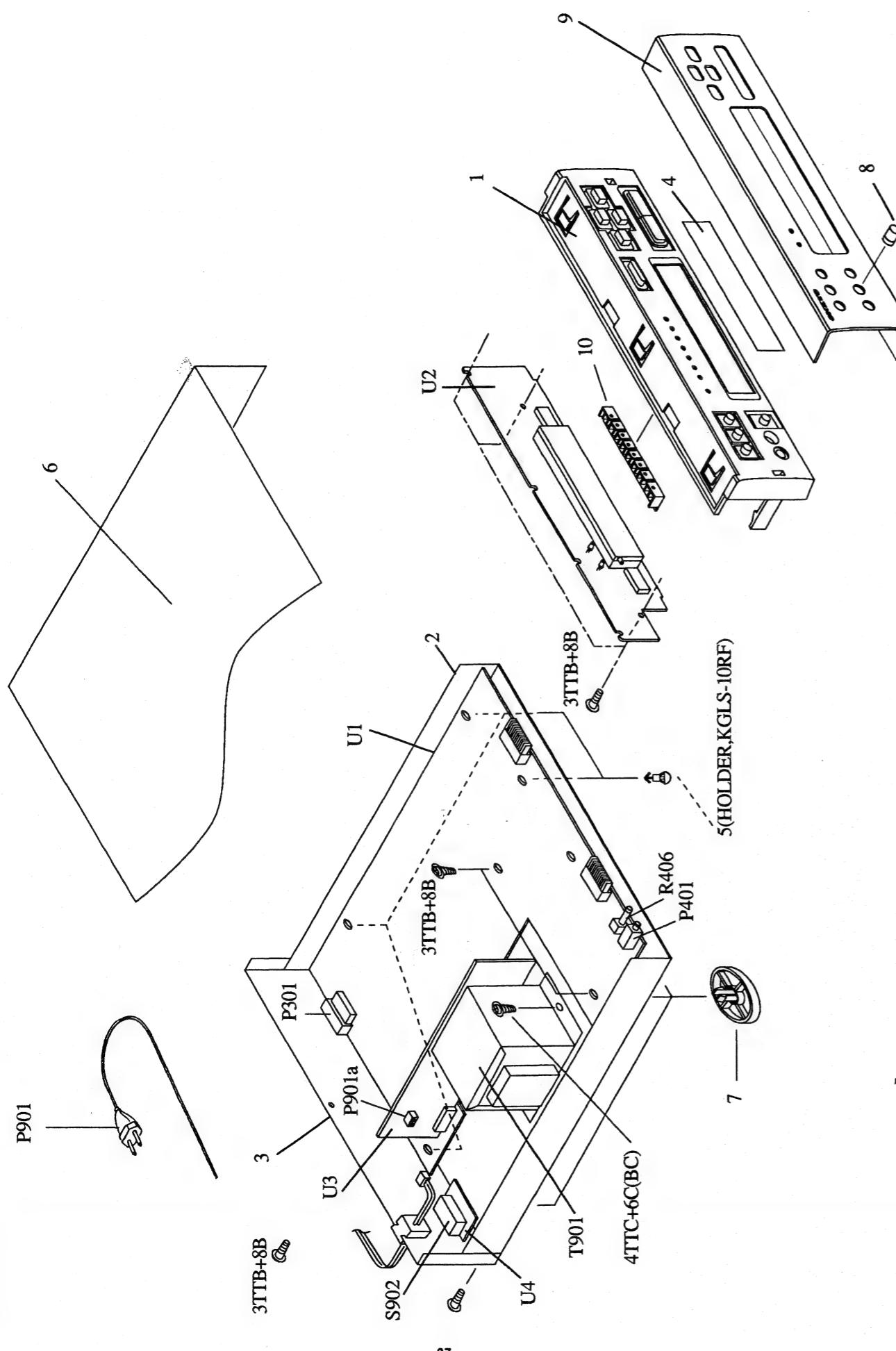
NOTE:

* : <WT, PT> model only.

No.	Symbol	I/O	Description	No.	Symbol	
1	G7			41	K0	
2	G6			42	K1	I Key input terminals.
3	G5	O	Output terminal for Digit.	43	K2	
4	G4			44	SYSSOUT	O Output terminal for system code. "L" when active.
5	G3			45	POFF	I Input terminal for detecting power suspension.
6	G2			46	SYSIN	I Input terminal for system code. "H" when active.
7	G1			47	REMIN	I Input terminal for remote control code. "L" when active.
8	VDD		Power supply terminal. (+5V)	48	IC	To be connected with Ground.
9	CL	O	Output terminal to be connected with CK terminal of TC9162N, CLK terminal of LC7522.	49	EFFECT	O Output terminal for EFFECT LED. "L" when EFFECT ON.
10	DATA	O	Output terminal to be connected with DATA terminal of TC9162N.	50	PEAKHOLD	O Output terminal for PEAK HOLD. "L" when spectrum analyzer with peak hold.
11	CE	O	Output terminal to be connected with CE terminal of TC9162N.	51		Not used. "L"
12	ST		Not used.	52	VDD	Power supply terminal. (+5V)
13	RQ			53	P1	
14	VDI	O	Output terminal to be connected with DI terminal of LC7522.	54	P2	
15	CENTRL		Not used.	55	P3	
16	REARRL			56	P4	
17	RESET	I	Reset input terminal. "L" when active.	57	P5	
18	MUTE	O	Audio muting output terminal. "H" when active.	58	P6	
19			Not used.	59	P7	
20	AVSS		Ground terminal for A/D converter.	60	P8	
21	MODE	I	Initializing input terminal. "L" when active.	61	P9	O Output terminal for Segment.
22	INF1			62	P10	
23	INF2			63	P11	
24	INF3			64	P12	
25	INF4	I	Analog input terminal for A/D converter.	65	P13	
26	INF5			66	P14	
27	INF6			67	P15	
28	INF7			68	P16	
29	AVDD		Power supply terminal for A/D converter. (+5V)	69	P17	
30	AVREF		Reference voltage of A/D converter.	70	P18	
31	XT1		Not used.	71	-V	
32	XT2			72	G16	
33	VSS		Ground terminal.	73	G15	
34	X1		Ceramic resonator connection terminal for the main system clock.	74	G14	
35	X2		Connect the ceramic resonator 4.19MHz.	75	G13	
36				76	G12	O output terminals for Digit.
37				77	G11	
38			Not used.	78	G10	
39				79	G9	
40				80	G8	

No.	Symbol	I/O	Description
1	G7		
2	G6		
3	G5	O	Output terminal for Digit.
4	G4		
5	G3		
6	G2		
7	G1		
8	VDD		Power supply terminal. (+5V)
9	CL	O	Output terminal to be connected with CK terminal of TC9162N, CLK terminal of LC7522.
10	DATA	O	Output terminal to be connected with DATA terminal of TC9162N.
11	CE	O	Output terminal to be connected with CE terminal of TC9162N.
12	ST		Not used.
13	RQ		
14	VDI	O	Output terminal to be connected with DI terminal of LC7522.
15	CENTRL		Not used.
16	REARRL		
17	RESET	I	Reset input terminal. "L" when active.
18	MUTE	O	Audio muting output terminal. "H" when active.
19			Not used.
20	AVSS		Ground terminal for A/D converter.
21	MODE	I	Initializing input terminal. "L" when active.
22	INF1		
23	INF2		
24	INF3		
25	INF4	I	Analog input terminal for A/D converter.
26	INF5		
27	INF6		
28	INF7		
29	AVDD		Power supply terminal for A/D converter. (+5V)
30	AVREF		Reference voltage of A/D converter.
31	XT1		Not used.
32	XT2		
33	VSS		Ground terminal.
34	X1		Ceramic resonator connection terminal for the main system clock.
35	X2		Connect the ceramic resonator 4.19MHz.
36			
37			
38			Not used.
39			
40			

EXPLODED VIEW



-27-

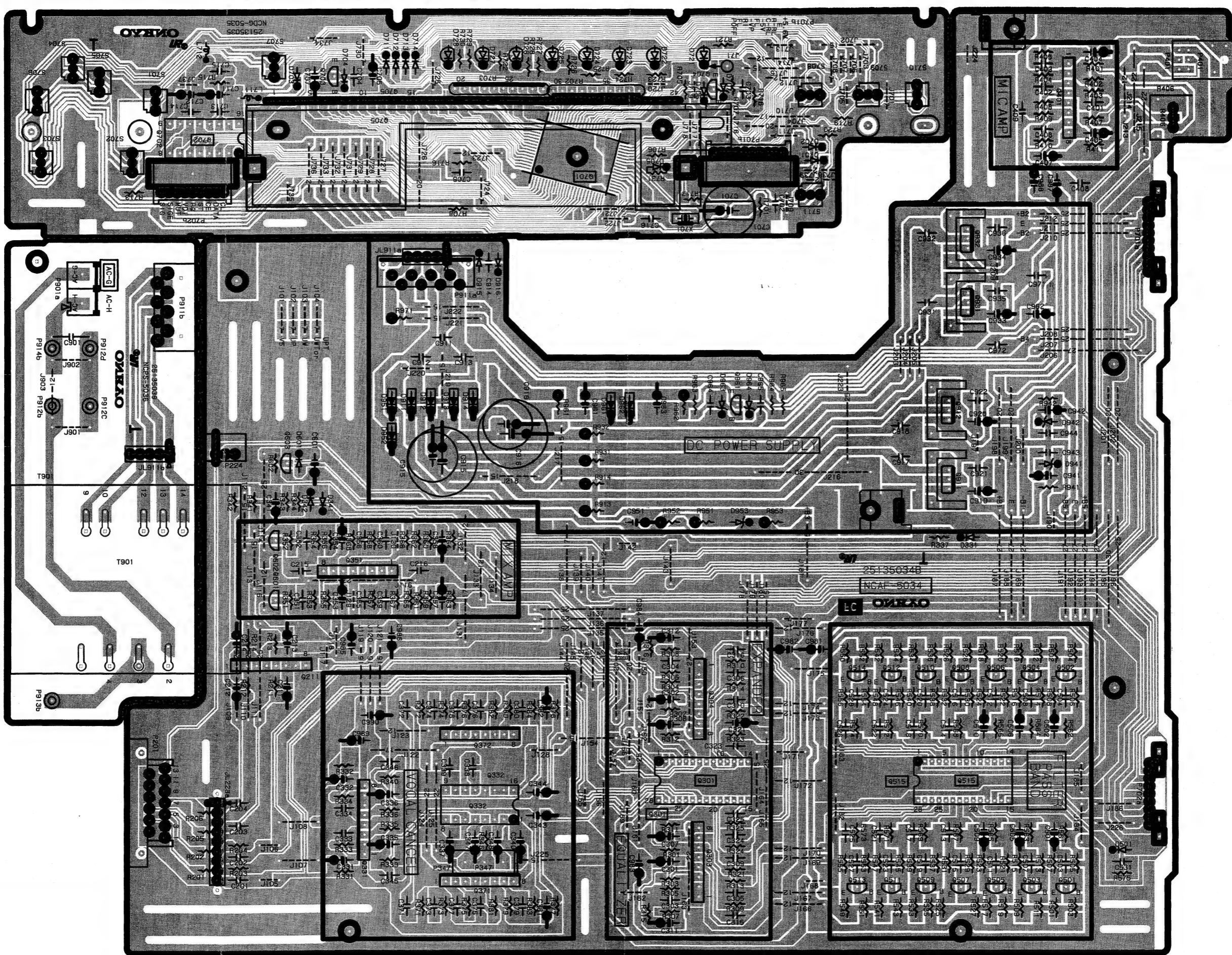
PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	27110811	Front bracket (S)	△	T901	2300924 Power transformaer, NPT-1178P, <P>
	27110812	Front bracket (B)		2300925	Power transformaer, NPT-1178DG, <W>
2	2710288A	Chassis	△	P901	253201IHT AC cord, AS-CEE
3	27121909	Rear panel, <P>	△	P901a	25055713 NPLG-2P669
	27121910	Rear panel, <W>	U1	1W129534-1 Main pc board assy, NAAF-5034-1, <P, W>	
		Clear plate		1W129534-1A	Main pc board assy, NAAF-5034-1, <WT, PT>
4	28191683	Holder, KGLS-10RF	U2	1W129535-1 Microprocessor pc board assy, NADG-5035-1, <P, W>	
5	27190428A	Cover (S)		1W129535-1A	Microprocessor pc board assy, NADG-5035-1A, <WT, PT>
6	28184545-1	Cover (B)	U3	1W129536-1 Power supply pc board assy, NAPS-5036-1, <P, WT, PT>	
	28184544A	Leg assy		1W129536-1A	Power supply pc board assy, NAPS-5036-1A, <W>
7	27175299A	Knob (S), <WT,PT>	U4	1W129537-1 Voltage selector pc board assy, NASAW-5037-1, <W>	
8	28324985	Knob (B), <WT,PT>			
	28324986	Front panel (S)	NOTE:	<P>	230V model only
9	27211625	Front panel (B)		<W>	Worldwide model only
	27211624	Front panel (S), <WT,PT>			
	27211652	Front panel (B), <WT,PT>			
	27211653	Front panel (B), <WT,PT>			
10	28198807	Facet			
	5104343	N09RL50KB15M, Volume			
	P301	25051245 Socket			
	P401	25045372 LGS6517-0202, Mic jack			

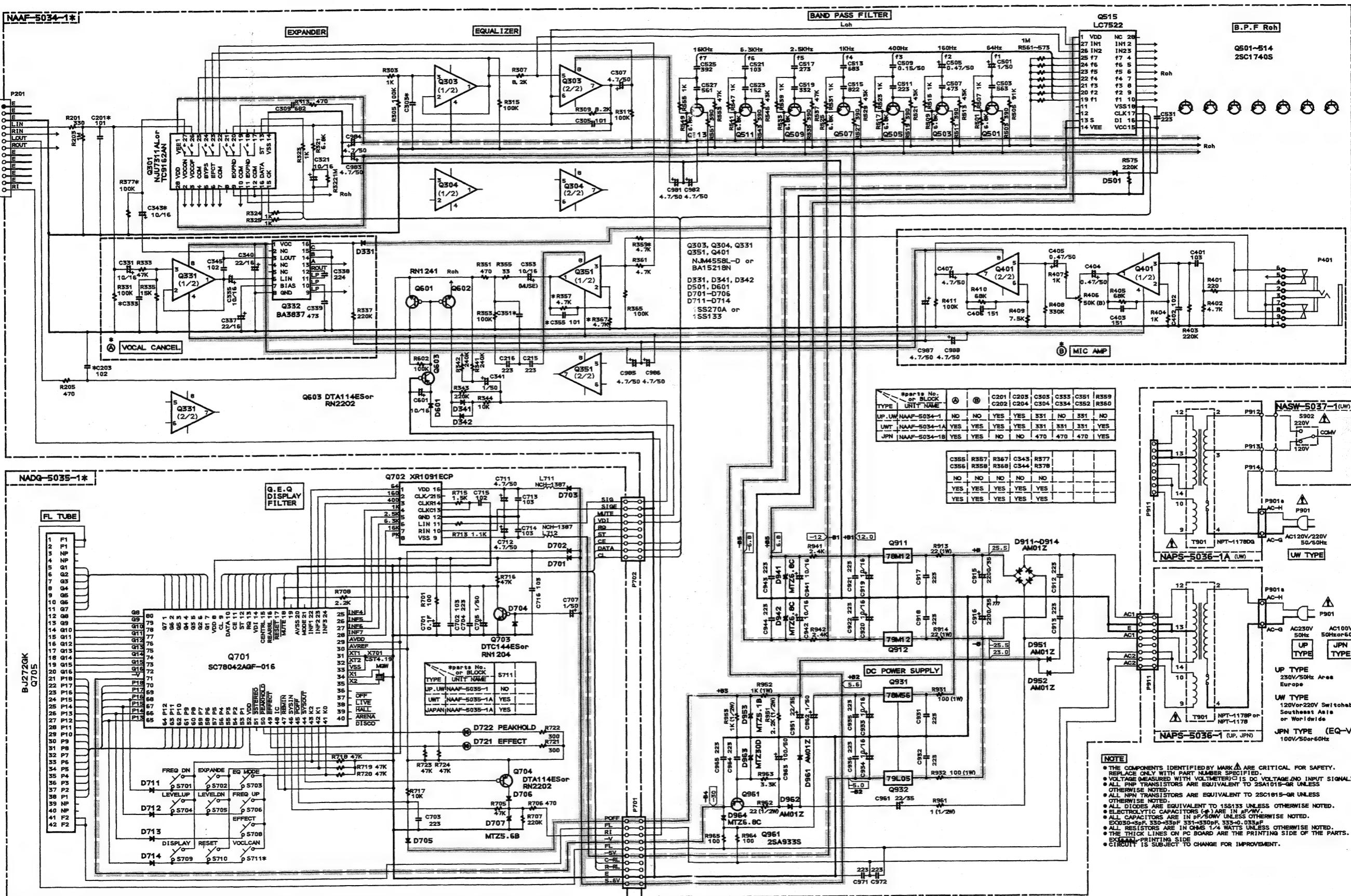
-28-

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



SCHEMATIC DIAGRAM

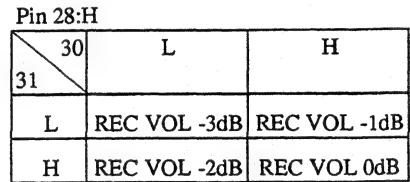
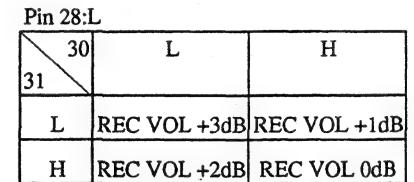
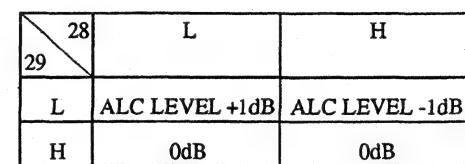


ONKYO CORPORATION

IC BLOCK DIAGRAMS AND DESCRIPTIONS**MICROPROCESSOR**

Pin No.	Terminal	I/O	Description	Remarks
1	T1 X1/X2	O	Speed control output of capstan motor	H:Normal speed, TAPE 1
2	T1 CAPSTAN	O	Capstan motor control output	H:On, TAPE 1
3	T1 SOLENOID	O	Solenoid coil control output	H:On, TAPE 1
4	NC			
5	T2 X1/X2	O	Speed control output of capstan motor	H:Normal speed, TAPE 2
6	T2 CAPSTAN	O	Capstan motor control output	H:On
7	T2 SOLENOID	O	Solenoid coil control output	H:On
8	DOLBY CLOCK	O	Clock output terminal for DOLBY IC	
9	DOLBY STB	O	Strobe output terminal for DOLBY IC	
10	DOLBY DATA	O	Data output terminal for DOLBY IC	
11	NC			
12	TEST		Test terminal	Connect to 5V.
13	RESET	I	Reset terminal	
14	OSC1		Ceramic resonator connection terminal	
15	OSC2		Connect the 4 MHz ceramic resonator.	
16	GND		Ground terminal	
17	X1		Not used.	
18	X2			
19	AVSS		Power source terminal for A/D converter	
20	T1 R.SENSOR	I	Signal input terminal from rotary sensor	
21	T2 R.SENSOR	I	Signal input terminal from rotary sensor	
22	Lch. LEVEL	I	A/D input terminal for input level signal	
23	Rch. LEVEL	I	This signal is used ALC and search signal.	
24	KEY 1	I	Operation key connection terminals	
25	KEY 2	I		
26	KEY 3	I		
27	KEY 4	I		
28	ALC PS LEVEL +/-	I	Fine adjustment input of automatic level control	
29	ALC LEVEL 1	I	Initializing input	
30	PS LEVEL 1	I	Refer to the table 1.	
31	PS LEVEL 2	I		
32	AVcc		Power source terminal for A/D converter	Connect to 5V.
33	Vcc		Power source terminal. (+5V)	Connect to 5V.
34	REC LED	O	REC indicator output terminal	H:On, TAPE 2
35	PAUSE LED	O	PAUSE indicator output terminal	H:On, TAPE 2
36	T2 REV LED	O	REWIND indicator output terminal	H:On, TAPE 2
37	T2 FWD LED	O	FORWARD indicator output terminal	H:On, TAPE 2
38	X2 DUB LED	O	HIGH DUBBING indicator output terminal	H:On
39	X1 DUB LED	O	NORMAL DUBBING indicator output terminal	H:On
40	T1 REV LED	O	REWIND indicator output terminal	H:On, TAPE 1
41	T1 FWD LED	O	FORWARD indicator output terminal	H:On, TAPE 1
42	T2 HIGH	O	Playback equalizer and bias current switching	TAPE 2
43	T2 NORMAL	O	output terminal. Refer to the table 2.	TAPE 2
44	BIAS CONT	O	Bias current control output terminal	
45	INPUT T1/T2	O	Input selector output terminal for TAPE-1/TAPE-2	H:TAPE 2
46	REC/PB	O	Selector output terminal for playback and recording head	
47	RI OUTPUT	O	System code output terminal	H

Pin No.	Terminal	I/O	Description	Remarks
48	RI INPUT	I	System code input terminal	
49	DOLBY B/C	O	Dolby selector terminal	
50	DOLBY ON/OFF	O	Refer to the table 3.	
51	POWER OFF	I	Detection input terminal for a stoppage of electric current	H
52	REC MUTE	O	Muting control output terminal for recording	H
53	NC			
54	LINE MUTE	O	Line muting control output terminal	H
55	F.T. SW	I	Detection input terminal of test mode	L
56	T2 R. REC SW.	I	Mechanism switch detection input terminal	TAPE 2
57	T2 METAL SW	I	Mechanism switch detection input terminal	TAPE 2
58	T2 F.REC SW	I	Mechanism switch detection input terminal	TAPE 2
59	T2 PACK IN SW	I	Mechanism switch detection input terminal	TAPE 2
60	T2 CrO2 SW	I	Mechanism switch detection input terminal	TAPE 2
61	T2 PLAY SW	I	Mechanism switch detection input terminal	TAPE 2
62	T1 PACK SW	I	Mechanism switch detection input terminal	TAPE 1
63	T1 PLAY SW	I	Mechanism switch detection input terminal	TAPE 1
64	TEST SW	I	Detection input terminal of test mode of tape mechanism	



	43	42
Type of tape	NORMAL	HIGH
NORMAL	H	L
HIGH(CrO2)	L	H
METAL	L	L

DOLBY ON/OFF	DOLBY B/C	DOLBY MODE
L	L	DOLBY OFF
L	H	DOLBY OFF
H	L	DOLBY B
H	H	DOLBY C

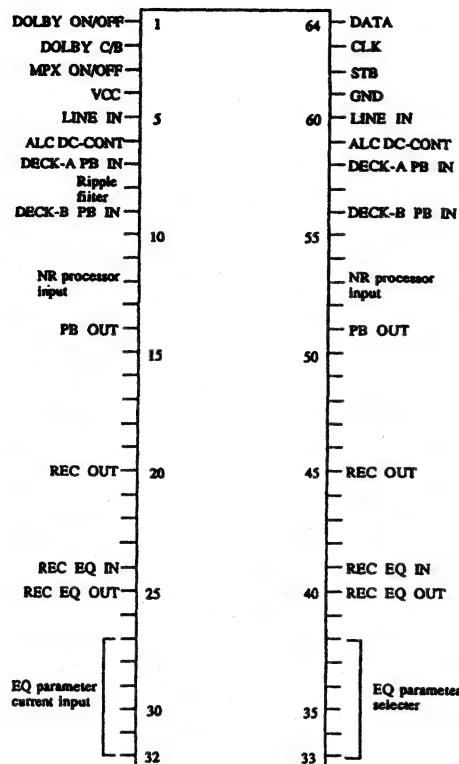
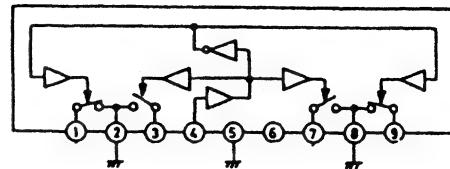
Table 2

Table 3

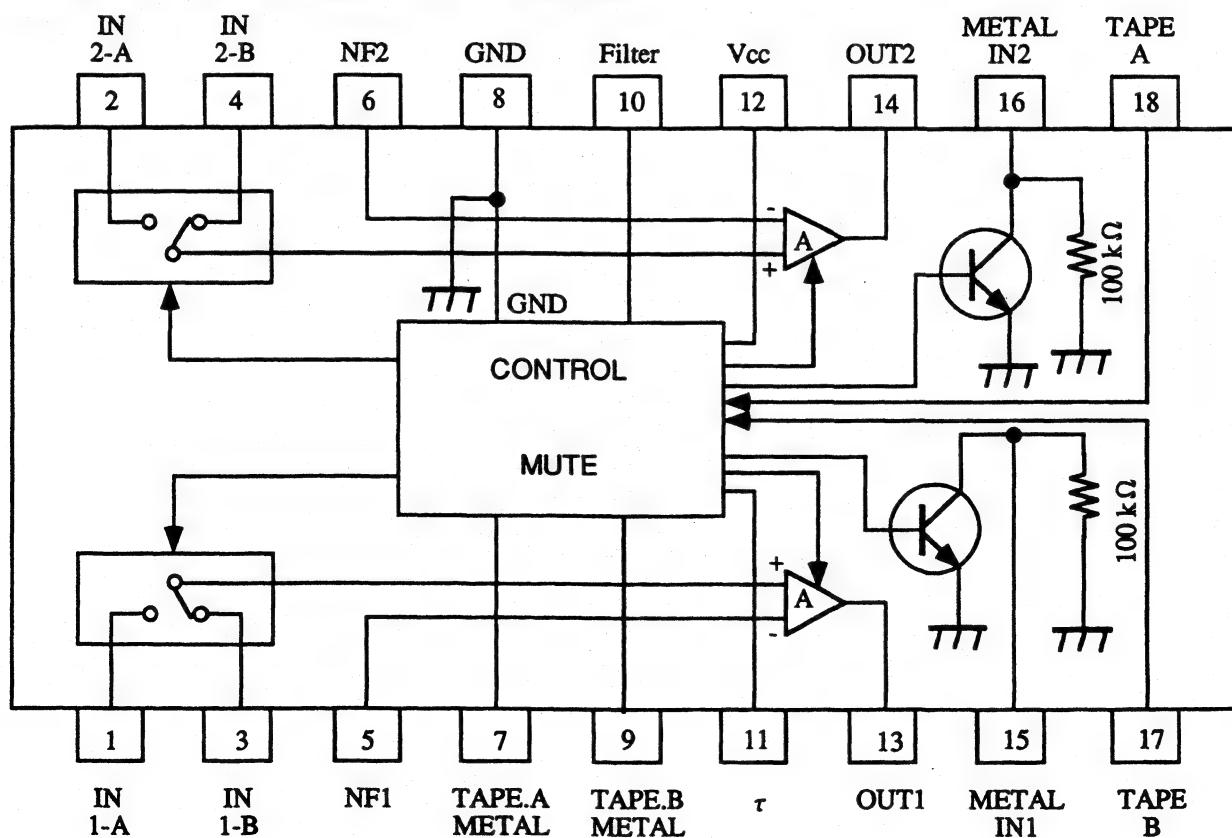
PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5046-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs			Coils	
Q101	22240767	BA3416BL	L101,L102	231089	NCH-2137
Q102	22240147	μ PC1330HA	L201,L202	233407	NMC-6079
Q201	22240544	HA12155NT	L401,L402	231127	NCH-4183 <K-32>
Q401	222959	μ PC1297CA <K-32>	L403	231215	NLO-2059
Q701	22240805	HD404338A18S	L405,L406	231165	NTR-6506
				Capacitors	
Q901	222780125MAT	78M12	C107,C108	393342217	220 μ F,16V,Elect.
Q902	222780124MAT or 222780124JRC	7812F or 7812FA	C109,C110	374723334	0.033 μ F \pm 5%,50V,Plastic
Q903	222780055MAT	78M05	C111,C112	374721534	0.015 μ F \pm 5%,50V,Plastic
	Transistors		C113,C114	374726814	680pF \pm 5%,50V,Plastic
Q107-Q109	221281 or	DTC114YS or	C115,C116	393341007	10 μ F,16V,Elect.
Q405,Q406	2213570	RN1207	C117,C118	374723315	330pF \pm 10%,50V,Plastic
Q203,Q204	2213284, 2213285, 2212115 or 2214915	2SC1740S-R, 2SC1740S-S, 2SC2458-GR or 2PC1815-GR	C119,C120	374721015	100pF \pm 10%,50V,Plastic
Q303,Q304	2211705 or 2211706	2SD655-E or 2SD655-F	C121,C122	393380107	1 μ F,50V,Elect.
Q402-Q404	2211544	2SC1959-Y	C123	393341007	10 μ F,16V,Elect.
Q407	2212853 or	2SB1068-K or	C124	393342207	22 μ F,16V,Elect.
Q704,Q705	2212855	2SB1068-U	C125	393344717	470 μ F,16V,Elect.
Q408	221281 or	DTC114YS or	C130,C228	374722734	0.027 μ F \pm 5%,50V,Plastic
Q702,Q703	2213570	RN1207	C201,C202	393380107	1 μ F,50V,Elect.
Q603,Q604	2213090 or	DTA114YS or	C203-C208	374722224	2200pF \pm 5%,50V,Plastic
Q718,Q904	2213590	RN2207	C209-C214	374721044	0.1 μ F \pm 5%,50V,Plastic
Q706,Q709	2213354,	2SA933S-R,	C215,C216	393341017	100 μ F,16V,Elect.
Q714,Q717	2213355, 2212125 or 2214905	2SA933S-S, 2SA1048-GR or 2PA1015-GR	C217,C218	393382297	0.22 μ F,50V,Elect.
Q707,Q708	221281 or	DTC114YS or	C219-C222	393380107	1 μ F,50V,Elect.
Q710,Q711	2213570	RN1207	C224	393380107	1 μ F,50V,Elect.
Q712,Q713	2212853 or 2212855	2SB1068-K or 2SB1068-U	C225,C903	393342217	220 μ F,16V,Elect.
Q715,Q716	221281 or	DTC114YS or	C301,C302	393380107	1 μ F,50V,Elect.
Q718-Q721	221281 or	DTC114YS or	C307,C308	393341007	10 μ F,16V,Elect.
Q905	2213570	RN1207	C401-C404	374723334	0.033 μ F \pm 5%,50V,Plastic <K-32>
	Diodes		C405,C406	374721034	0.01 μ F \pm 5%,50V,Plastic <K-32>
D701,D703	223163,	1SS133,	C411,C412	370131214	120pF \pm 5%,100V,Plastic <K-32>
D704,D913	223205 or	1SS270A or	C415,C416	393341007	10 μ F,16V,Elect. <K-32>
D914,D916	223222	WG713A	C418	374721834	0.018 μ F \pm 5%,50V,Plastic
D702	224450562	MTZ5.6B	C419,C421	374724724	4700pF \pm 5%,50V,Plastic
D905-D912	22380035	GP104003E	C420	374722234	0.022 μ F \pm 5%,50V,Plastic
D915	224450562	MTZ5.6B	C423	393341017	100 μ F,16V,Elect.
	Resonator		C424	393322211	220 μ F,6.3V,Elect.
X701	3010150	CST4.00MGW,Ceramic	C427,C428	393341007	10 μ F,16V,Elect.
			C429	370131234	0.012 μ F \pm 5%,100V,Plastic
			C702,C904	393341007	10 μ F,16V,Elect.
			C706,C712	393321017	100 μ F,6.3V,Elect.
			C901	374722734	0.027 μ F \pm 5%,50V,Plastic
			C902	393354727	4700 μ F,25V,Elect.
			C906,C907	393341007	10 μ F,16V,Elect.
			C908,C910	393362207	22 μ F,35V,Elect.
			C909	393382297	0.22 μ F,50V,Elect.
			C912	393342227	2200 μ F,16V,Elect.
			C914	374721044	0.1 μ F \pm 5%,50V,Plastic

HA12155NT (DOLBY NR) **μ PC1330HA (REC/PB SW)** **μ PC1330HA**

Pin No.	Function
1, 9	PB. signal
2	GND
3, 7	REC signal
4	REC/PB SW control
5	GND
6	+B
8	GND

BA3416BL (Dual Playback Preamplifier)

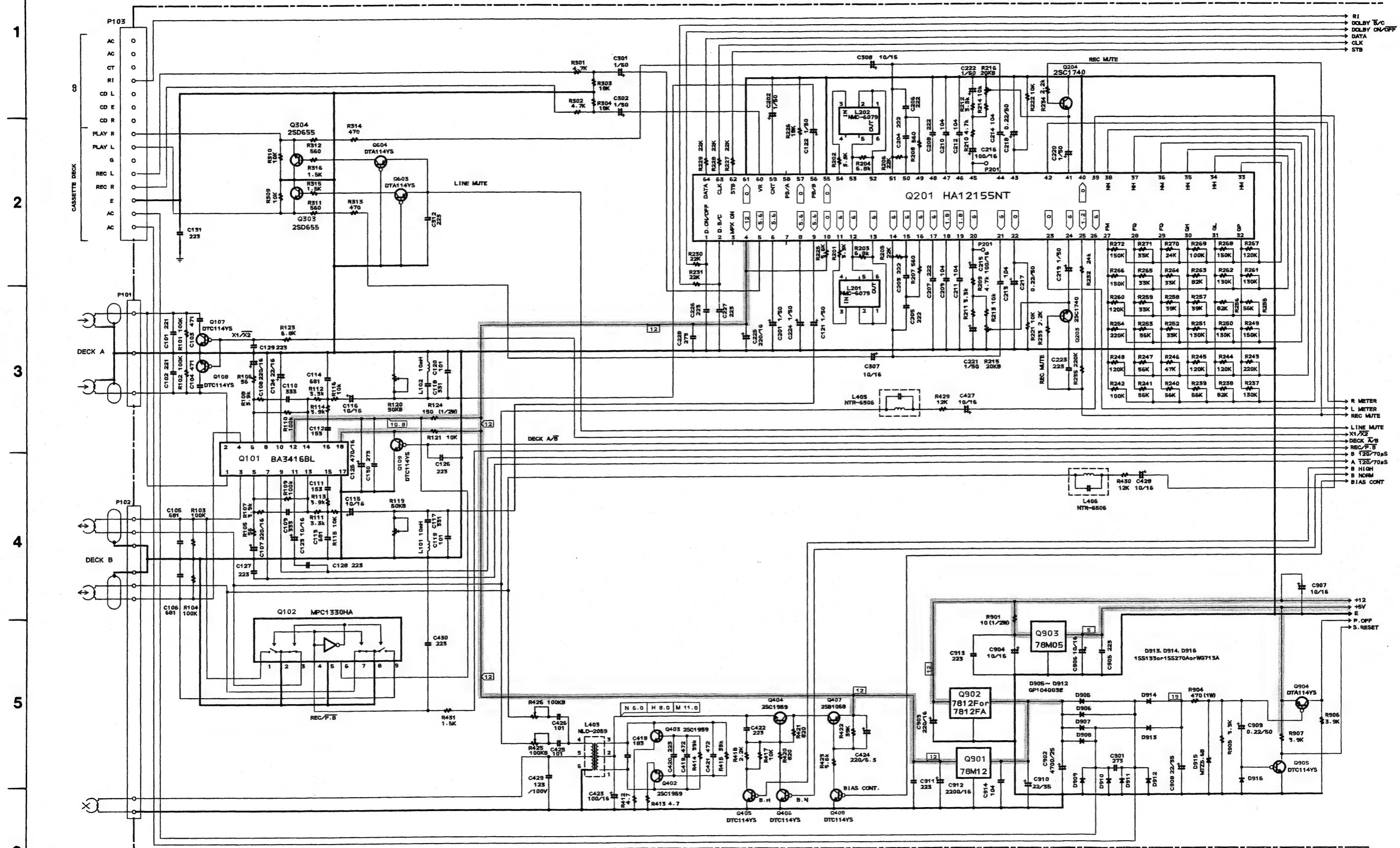
CIRCUIT NO.	PART NO.	DESCRIPTION	OPERATION SWITCH PC BOARD (NASW-5048-1)		
			CIRCUIT NO.	PART NO.	DESCRIPTION
		Resistors			
R119,R120	5210265	N06HR50KBC,Trim	D851,D852	225256B,	SEL3410E-B,
R124	443521514	150 ohm±5%,1/2W,Metal oxide	D851,D852	225256C or	SEL3410E-C or
R215,R216	5210263	N06HR20KBC,Trim	D851,D852	225256D	SEL3410E-D
R403,R404	5210262	N06HR10KBC,Trim <K-32>	D853,D854	225255B,	SEL3110S-B
R425,R426	5210266	N06HR100KBC,Trim <K-22>	D853,D854	225255C or	SEL3110S-C or
R702	49163392410	3.9 kohm×10,1/10W,Array	D853,D854	225255D	SEL3110S-D
R703	49163392408	3.9 kohm×8,1/10W,Array	S851-S857	Switches	
R730,R739	5210258	N06HR1KBC,Trim	S851-S857	25035659	NPS-111-S611
R731,R740	5210259	N06HR2KBC,Trim		Socket	
R901	443521004	10 ohm±5%,1/2W,Metal oxide	P704A	2009990340	NSAS-14P0476
R904	443624714	470 ohm±5%,1W,Metal oxide		Clamp	
		Plugs		27301642	X-4-3U
P101	25055715	NPLG-3P671			
P102	25055138	NPLG-8P122			
P201	25055038	NPLG-2P29			
P703,P704	25055445	NPLG-7P427			
		Sockets			
P103	25051247	NSCT-15P1037			
P701	25051104	NSCT-10P891			
P702	25051129	NSCT-13P916			

OPERATION SWITCH PC BOARD (NASW-5047-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
		LEDs
D801,D802	225256B,	SEL3410E-B,
	225256C or	SEL3410E-C or
	225256D	SEL3410E-D
D803,D804	225255B,	SEL3110S-B
	225255C or	SEL3110S-C or
	225255D	SEL3110S-D
		Switches
S801-S807	25035659	NPS-111-S611
S808	25065344	NSS-12134
S809	25065346	NSS-13135
		Socket
P703A	2009990339	NSAS-14P0475
		Clamp
	27301642	X-4-3U

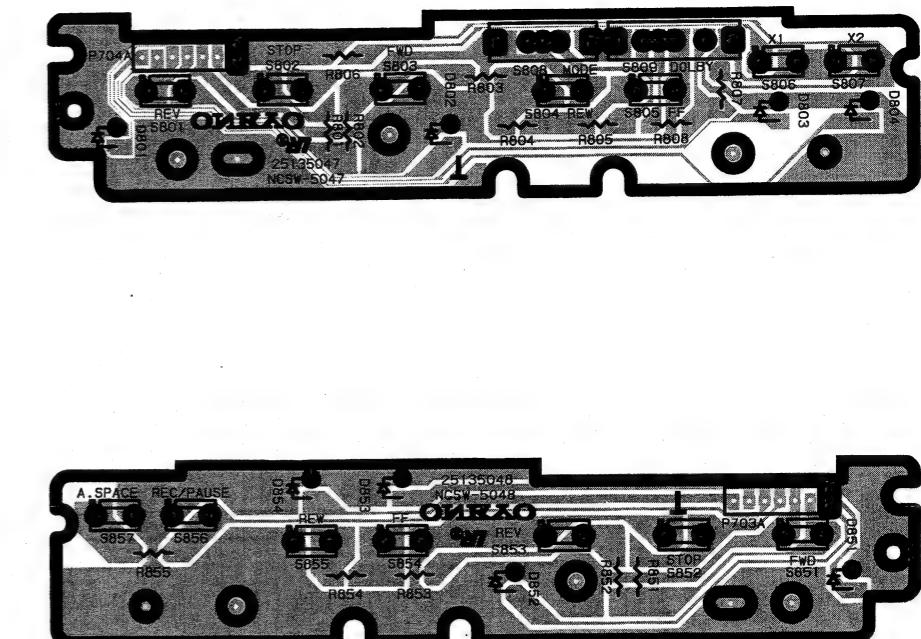
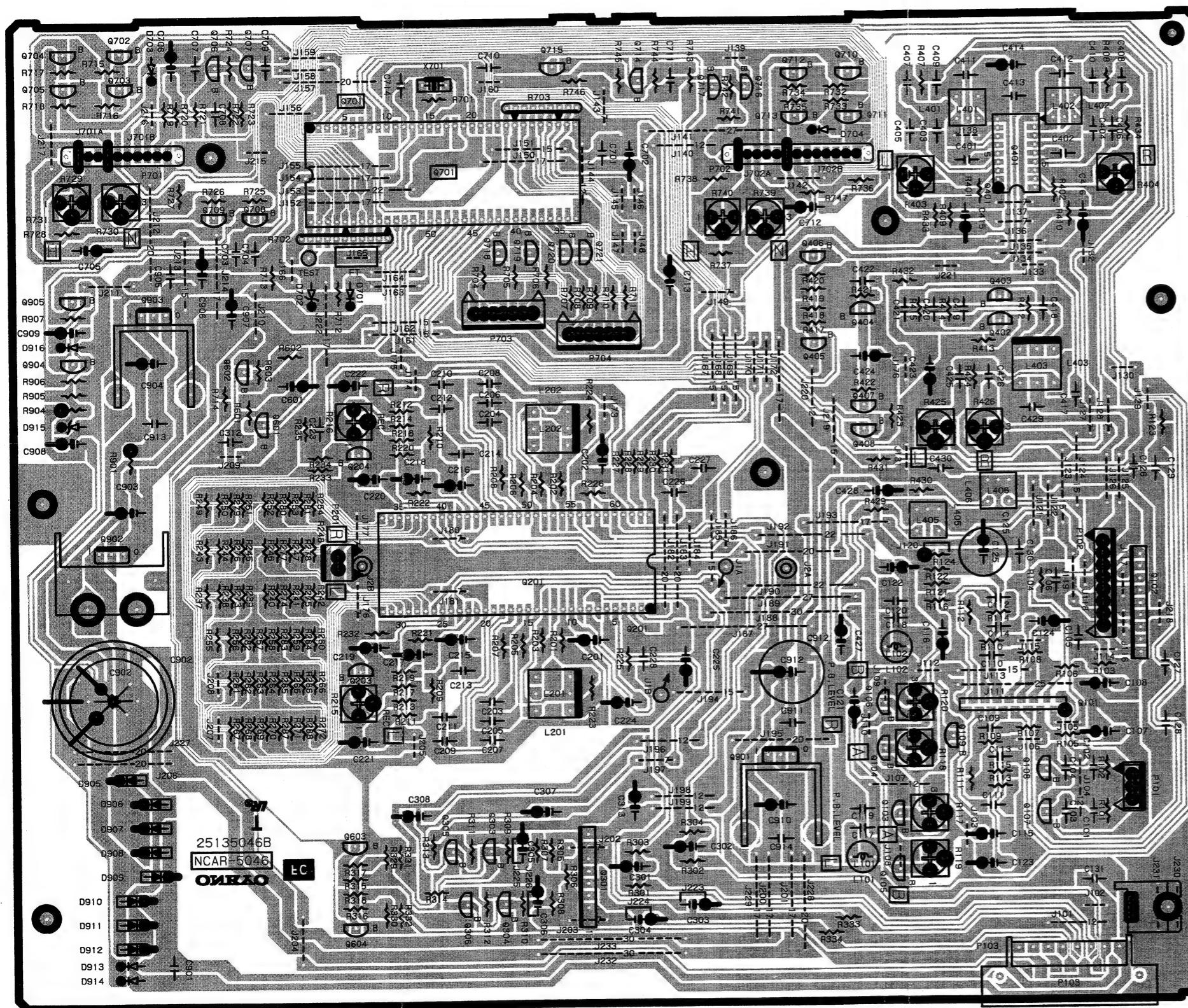
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SCHEMATIC DIAGRAM

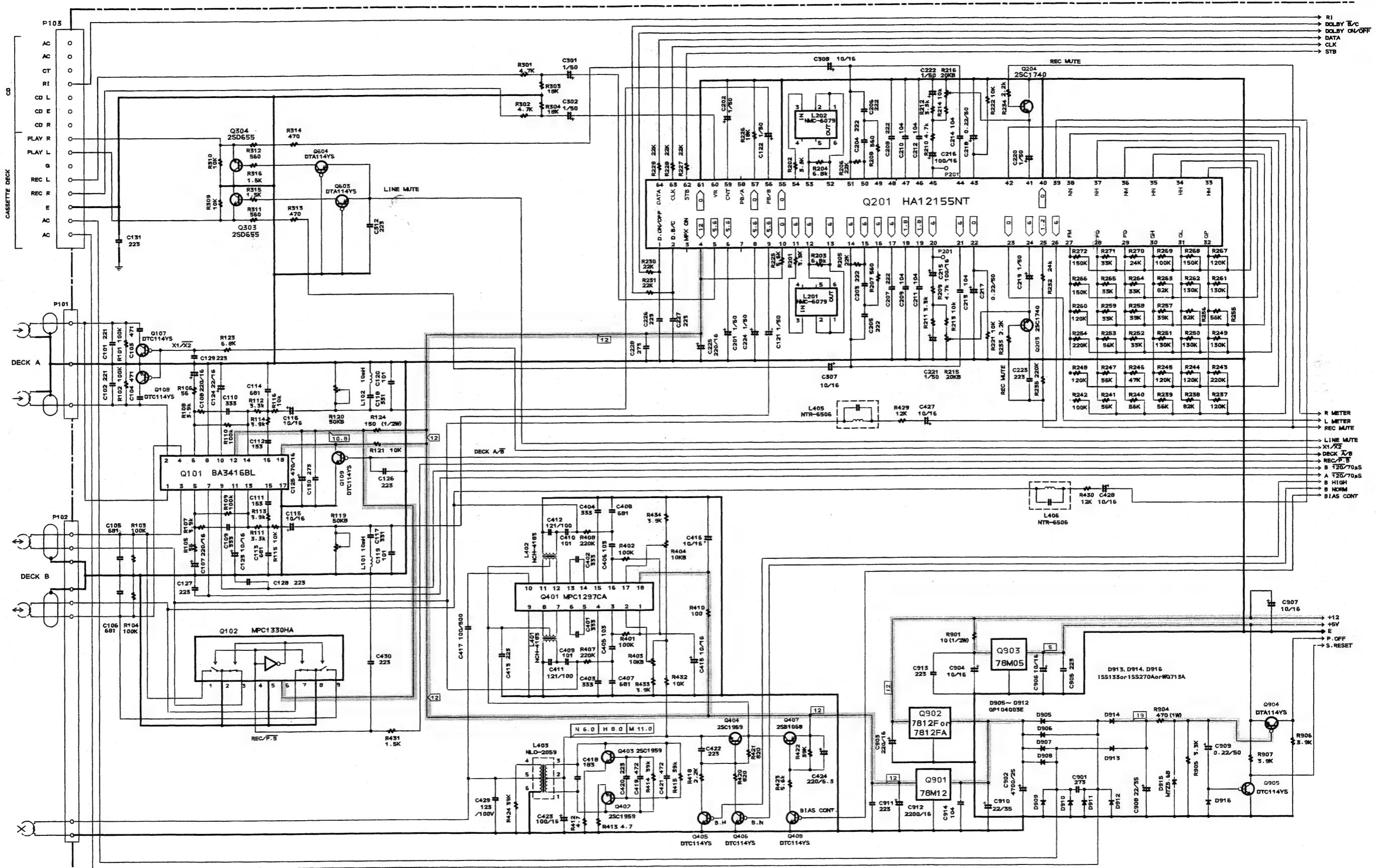


ONKYO CORPORATION

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



SCHEMATIC DIAGRAM



A

B

C

D

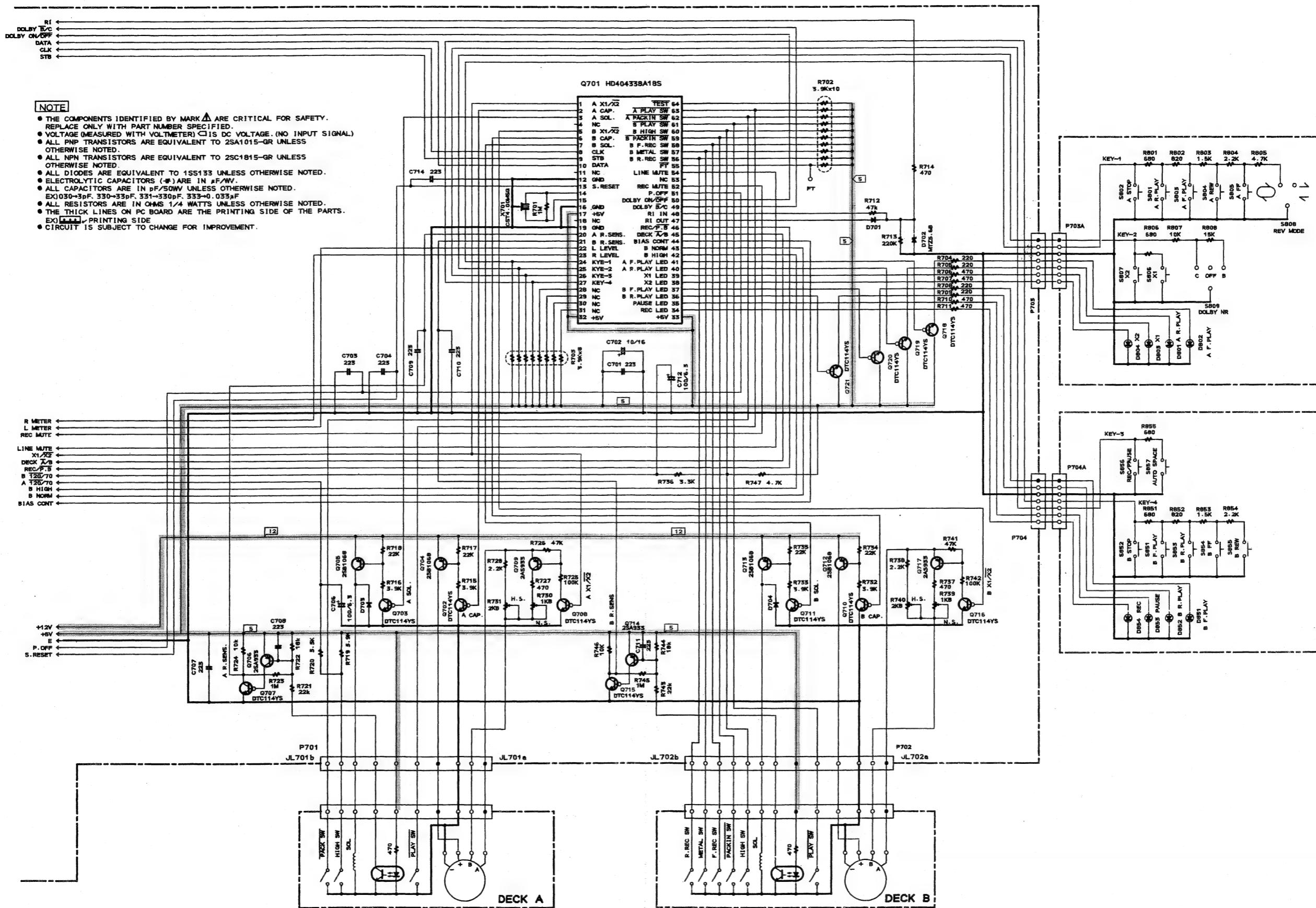
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F

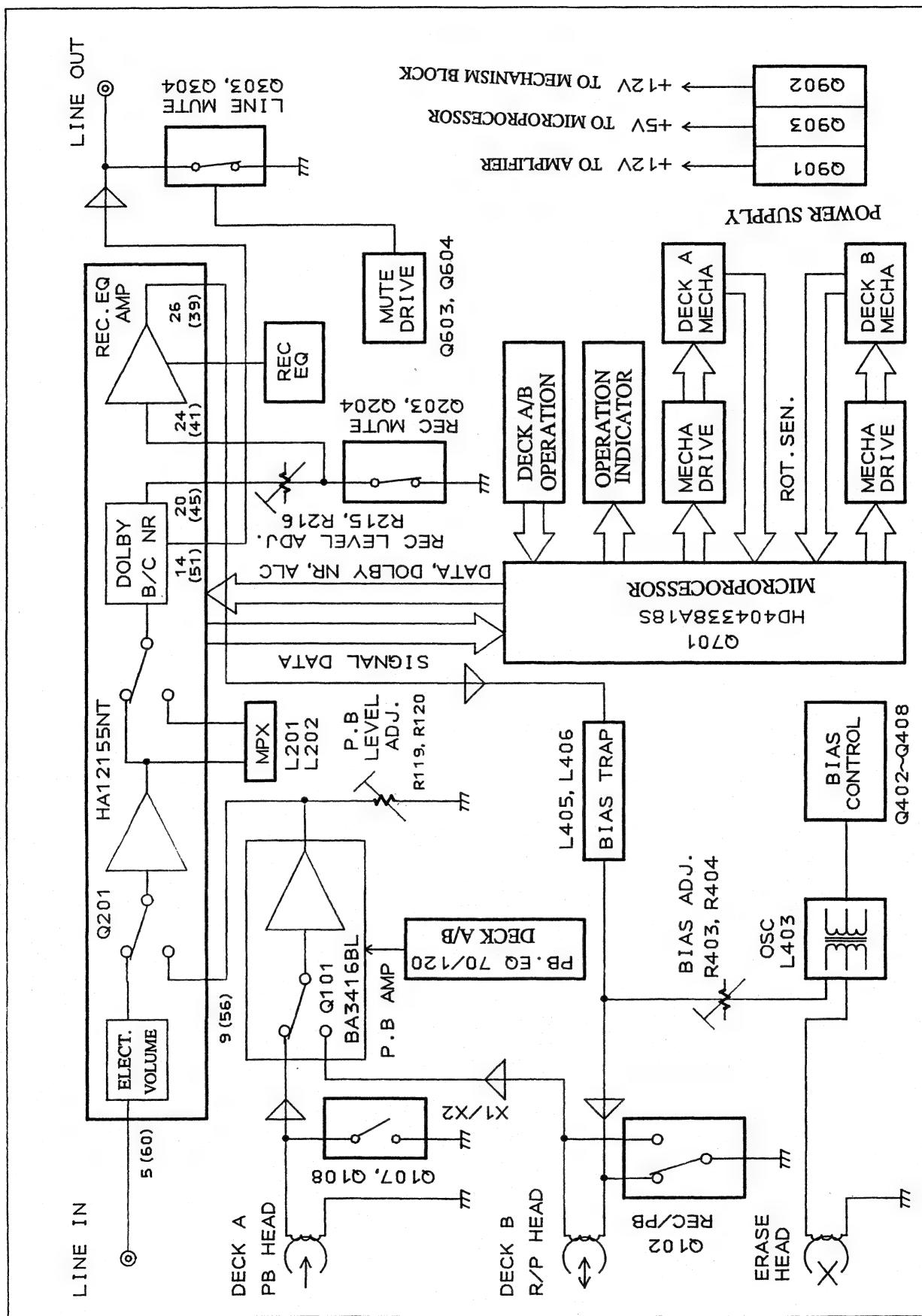
G

H

SCHEMATIC DIAGRAM



BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moistend swab.

* record/playback head	* erase head
* pinch roller	* capstan
2. Do not use magnetized screwdriver for adjustments.
3. Demagnetize record/playback head with a lead demagnetizer.

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screwdriver
Test tapes

TCC-153	:10kHz, -15dB
MTT-111	:3kHz, -10dB
MTT-150	:Dolby level calibration 400Hz, tone 200nWb/m

Tape speed adjustment

Connect the digital frequency counter to the line output terminal.

Load the test tape MTT-111 into the cassette holder.

Connect the test point J165 to the ground to be the unit to adjustment mode.

Press the forward play button. (The unit becomes the high speed.)

Adjust the trim resistors R731(Deck A) and R740(Deck B) so that the frequency counter reading becomes 6000Hz to 6020Hz.

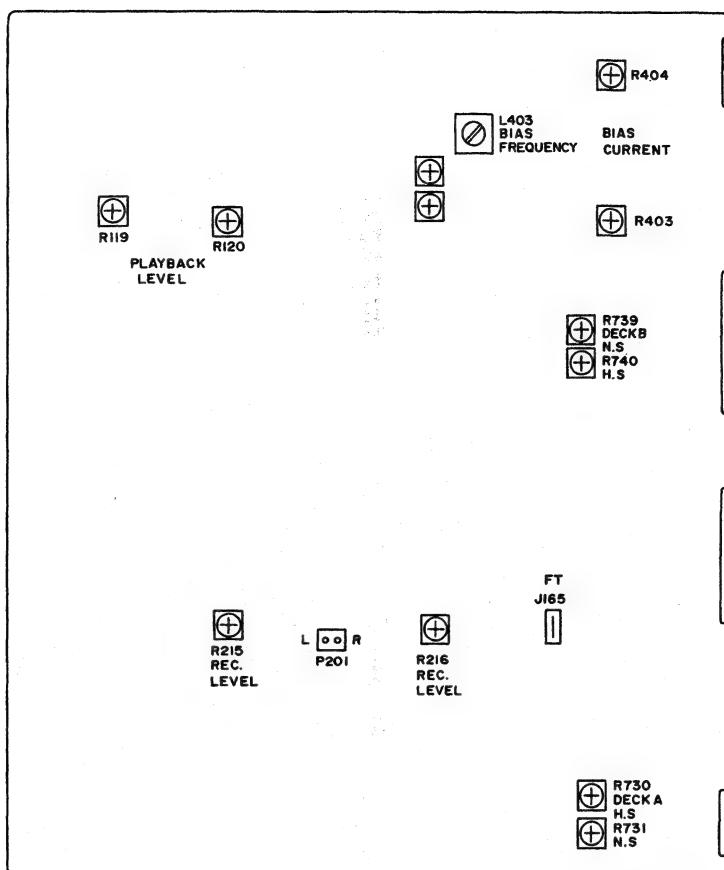
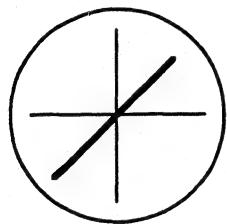
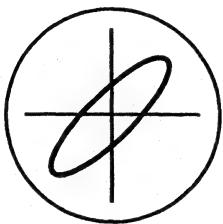
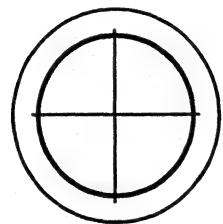
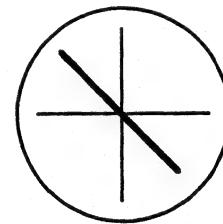
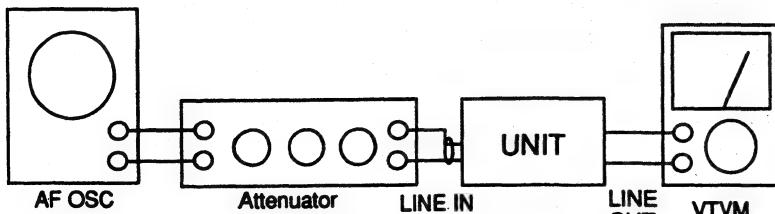
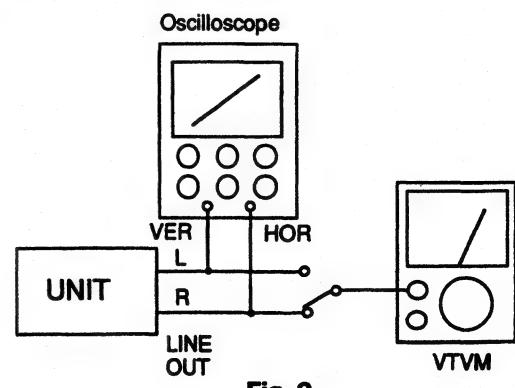
Press the forward play button. (The unit becomes the normal speed.)

Adjust the trim resistors R730(Deck A) and R739(Deck B) so that the frequency counter reading becomes 3000Hz to 3010Hz.

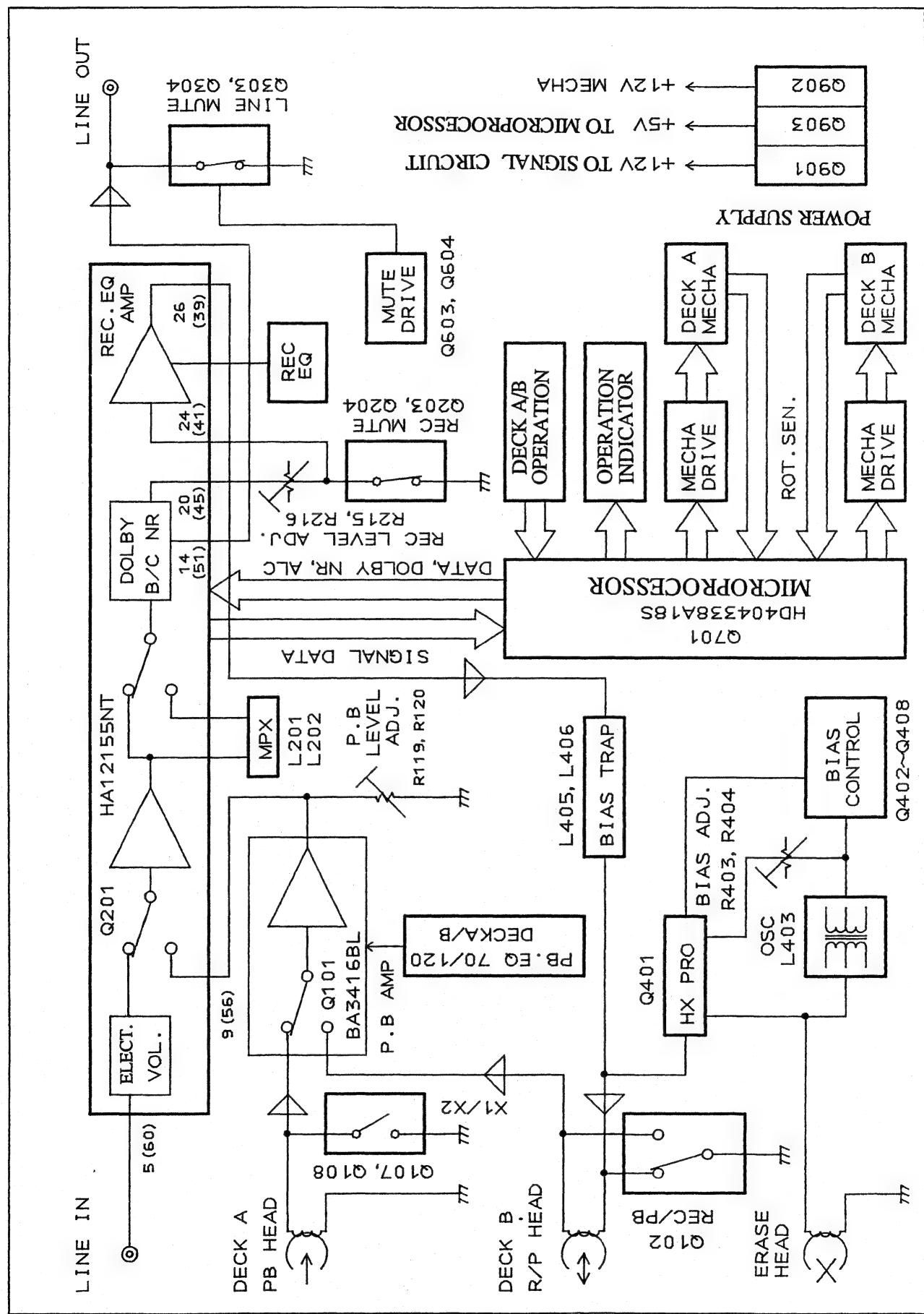
Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		TCC-153	PB	AC voltmeter Oscilloscope	Head azimuth screw	Maximum and same phase at channels L and R	fig-1 fig-3
2	Playback level	AC voltmeter to terminals P201		MTT-150	PB	AC voltmeter	DECK B R119 (ch. L) R120 (ch. R)	300mV	
3	Bias frequency	Frequency counter to P102		METAL TAPE XS-C90	REC	Frequency counter	L403	85kHz±2kHz	
4	Bias current	fig-2	1kHz, -23dB and 12kHz, -23dB	UD-1 C-90	REC/PB	AC voltmeter	(K-32) R403 (ch. L) R404 (ch. R) (K-22) R425 (ch. L) R426 (ch. R)	Same level at 1kHz and 12kHz	Repeat the recording and play back until the 1kHz and 12kHz playback signals are same level.
5	Record level	fig-2	1kHz	UD-1 C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	R215 (ch. L) R216 (ch. R)	Same level at REC/PB	

Blank tape NORMALUD-1 C-90
 HIGHXL-II C-90
 METALXS C-60

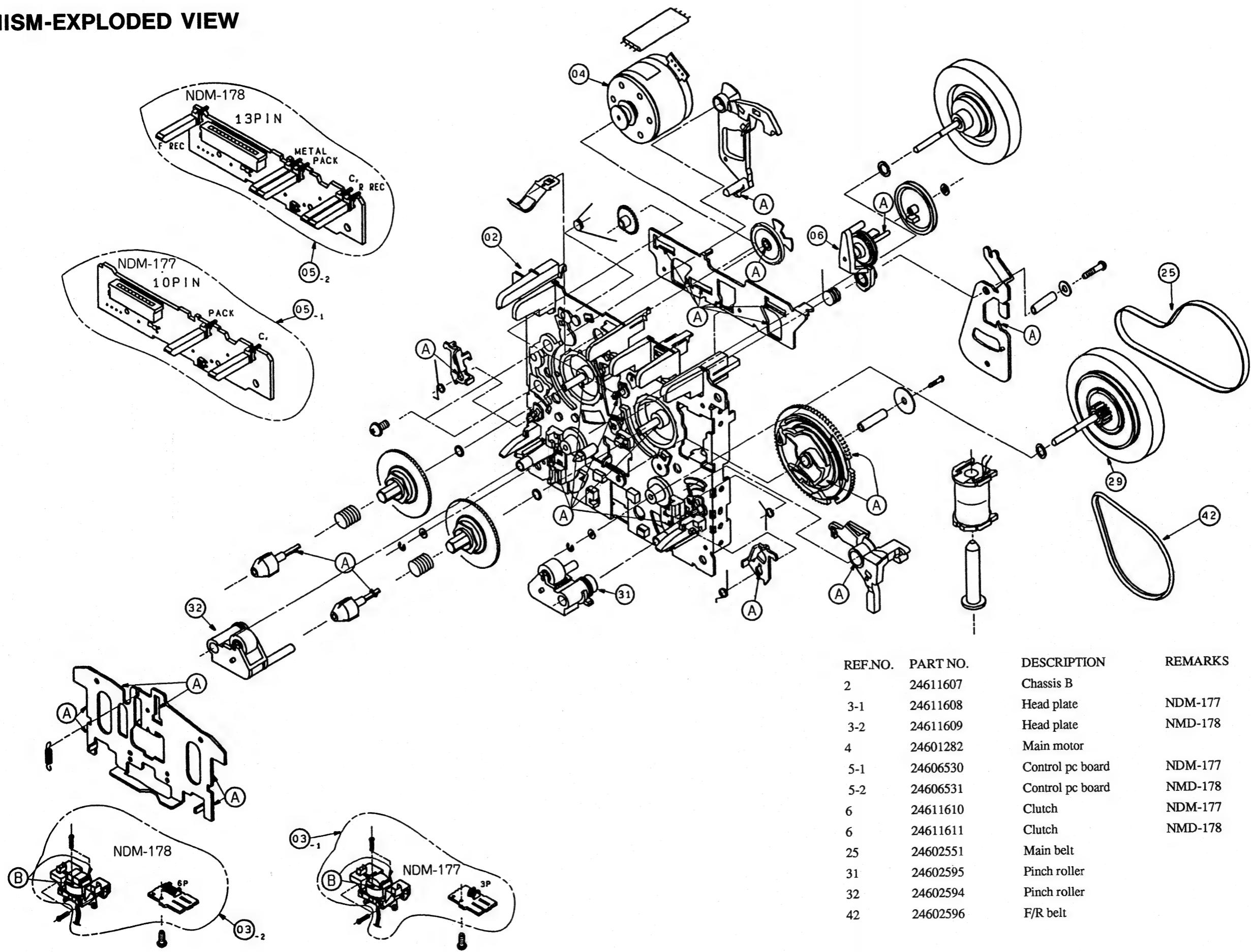
PLAY torque30~70g/cm
 FF. REW torque80~180g/cm
 Back tension6~12g/cm

**Adjustment point****0° (IN PHASE)****45°****90°****180°****Confirming phase relationship****Fig. 1****Fig. 2****Fig. 3**

BLOCK DIAGRAM

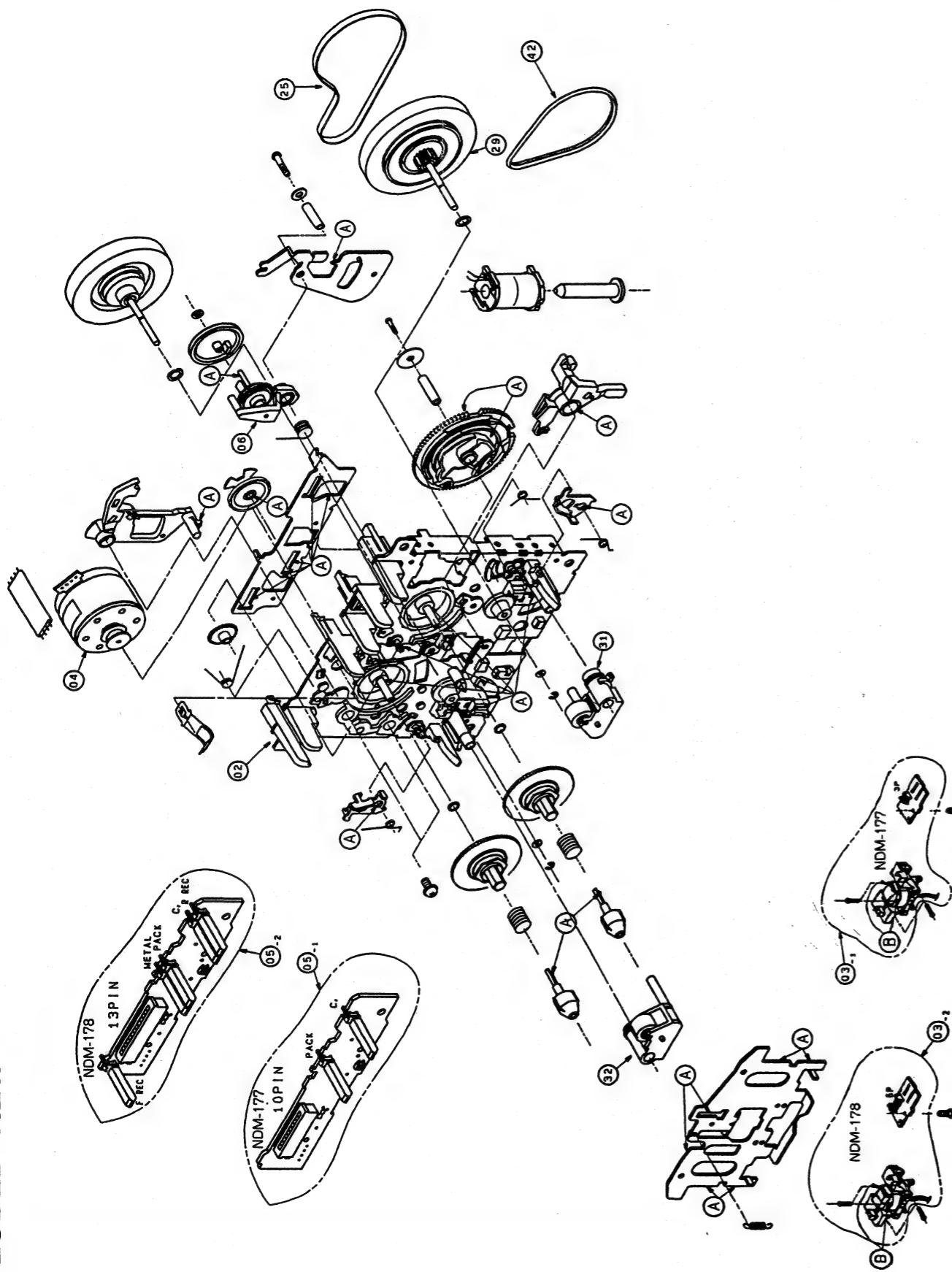


MECHANISM-EXPLODED VIEW



REF.NO.	PART NO.	DESCRIPTION	REMARKS
2	24611607	Chassis B	
3-1	24611608	Head plate	NDM-177
3-2	24611609	Head plate	NMD-178
4	24601282	Main motor	
5-1	24606530	Control pc board	NDM-177
5-2	24606531	Control pc board	NMD-178
6	24611610	Clutch	NDM-177
6	24611611	Clutch	NMD-178
25	24602551	Main belt	
31	24602595	Pinch roller	
32	24602594	Pinch roller	
42	24602596	F/R belt	

EXPLODED VIEW



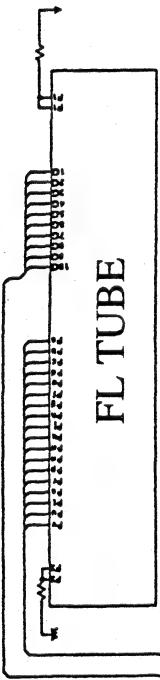
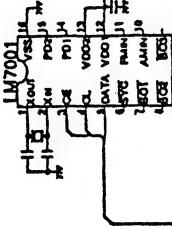
K-22/K-32 K-22/K-32

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	27110804A	Front bracket <S>	47	27301823A	Cassette lid B <S> <K-32>
	27110805A	Front bracket 		27301820A	Cassette lid B <S> <K-22>
2	27262580	Plate		27301825	Cassette lid B <K-32>
5	28400282	Damper		27301827	Cassette lid B <K-22>
6	27180540	Spring B	48	27301818A	Cassette lid BSA <S>
7	27180541	Spring A		27301819	Cassette lid BSA
11	27130733B	Bracket F	49	27301820A	Cassette lid BSB <S>
14	2840463C	Cassette frame		27301821	Cassette lid BSB
15	27180272A	Spring	50	28191681A	Clear plate
17	28324839-2Y	Knob E/A <S>	51	260208	Wire tie
	28324839Y	Knob E/A 	53	28140860	Cushion
18	28324840-2Y	Knob E/B <S>	55	27175299A	Leg
	28324840Y	Knob E/B 	JL101	2009990325	NSAS-6P0461,Socket
19	27141556AY	Bracket, eject	JL102	2009990326	NSAS-14P0462,Socket
20	27301617BY	Spring,eject	U1	1N193546-1	NAAR-5046-1,Main circuit pc board ass'y <K-32>
21	28324975	Knob,Dolby <S>		1N194546-2	NAAR-5046-2,Main circuit pc board ass'y <K-22>
	28324976	Knob,Dolby 	U2	1N193547-1	NASW-5047-1,Operation switch pc board ass'y
24	27100285	Chassis	U3	1N193548-1	NASW-5048-1,Operation switch pc board ass'y
27	27121890A	Rear panel <K-32>	Z1	244186	NDM-177,Deck mechanism
	27121889A	Rear panel <K-22>	22	244187	NDM-178,Deck mechanism
33	838430088	3TTB+8B(BC),Self-tapping screw	Z3	24611605	Eject ass'y L
34	838430088	3TTB+8B,Self-tapping screw	Z4	24611606	Eject ass'y R
35	838430108	3TTB+10B,Self-tapping screw	Z5	833126047	2.6TP+4S,Self-tapping screw
40	27190524	KGLS-14RF,Holder			
41	28184567-1	Top cover <S>			
	28184566A	Top cover 			
42	834230108	3TTS+10B(Ni),Self-tapping screw <S>			
	838430088	3TTB+8B(BC),Self-tapping screw 			
43	27211614	Front panel <S>			
	27211615	Front panel 			
44	28198803	Facet A			
45	28198804	Facet B			
46	27301830A	Cassette lid A <S> <K-32>			
	27301828	Cassette lid A <S> <K-22>			
	27301831	Cassette lid A <K-32>			
	27301829	Cassette lid A <K-22>			

[B]: Black model only
[S]: Silver model only

MICROPROCESSOR-CONNECTION VIEW



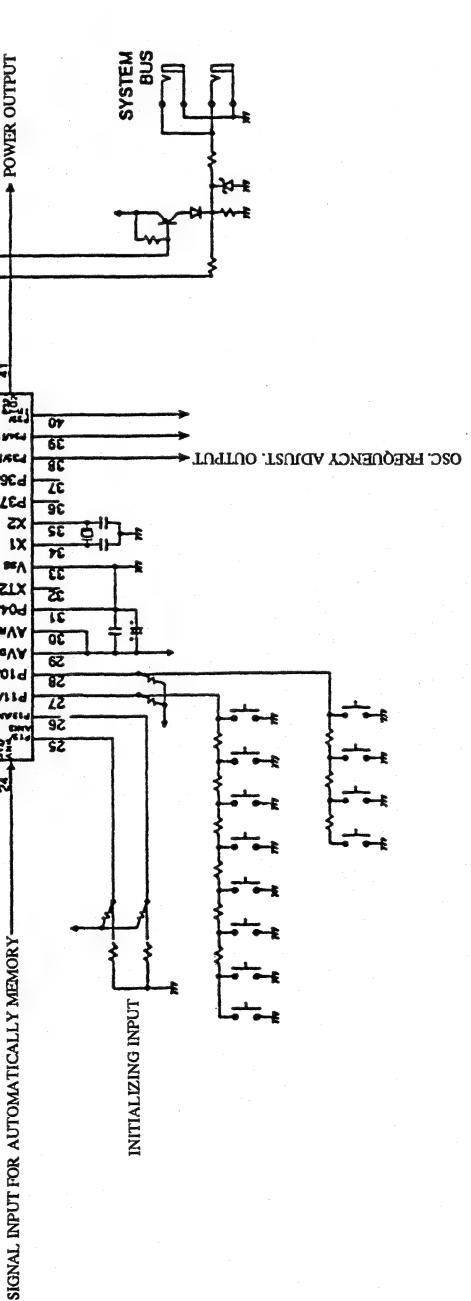
PIN NO.	15	16
OPERATION	VOLUP	VOLDOWN
STOP	H	H
VOLUME UP	H	L
VOLUME DOWN	L	H
POWER OFF	L	L

Table 1

BAND1 BAND0	Region	Frequency range	Channel space
0	1 Europe	87.50~108.00MHz	50 kHz
1	0 Saudi Arabia	87.50~108.00MHz	50 kHz
1	1 U.S.A.	87.9~107.90MHz	200 kHz

AM	Region	Frequency range	Channel space
0	Europe	522~1611 kHz	9 kHz
0	Saudi Arabia	531~1602 kHz	50 kHz
1	U.S.A.	530~1710 kHz	200 kHz

Table 2

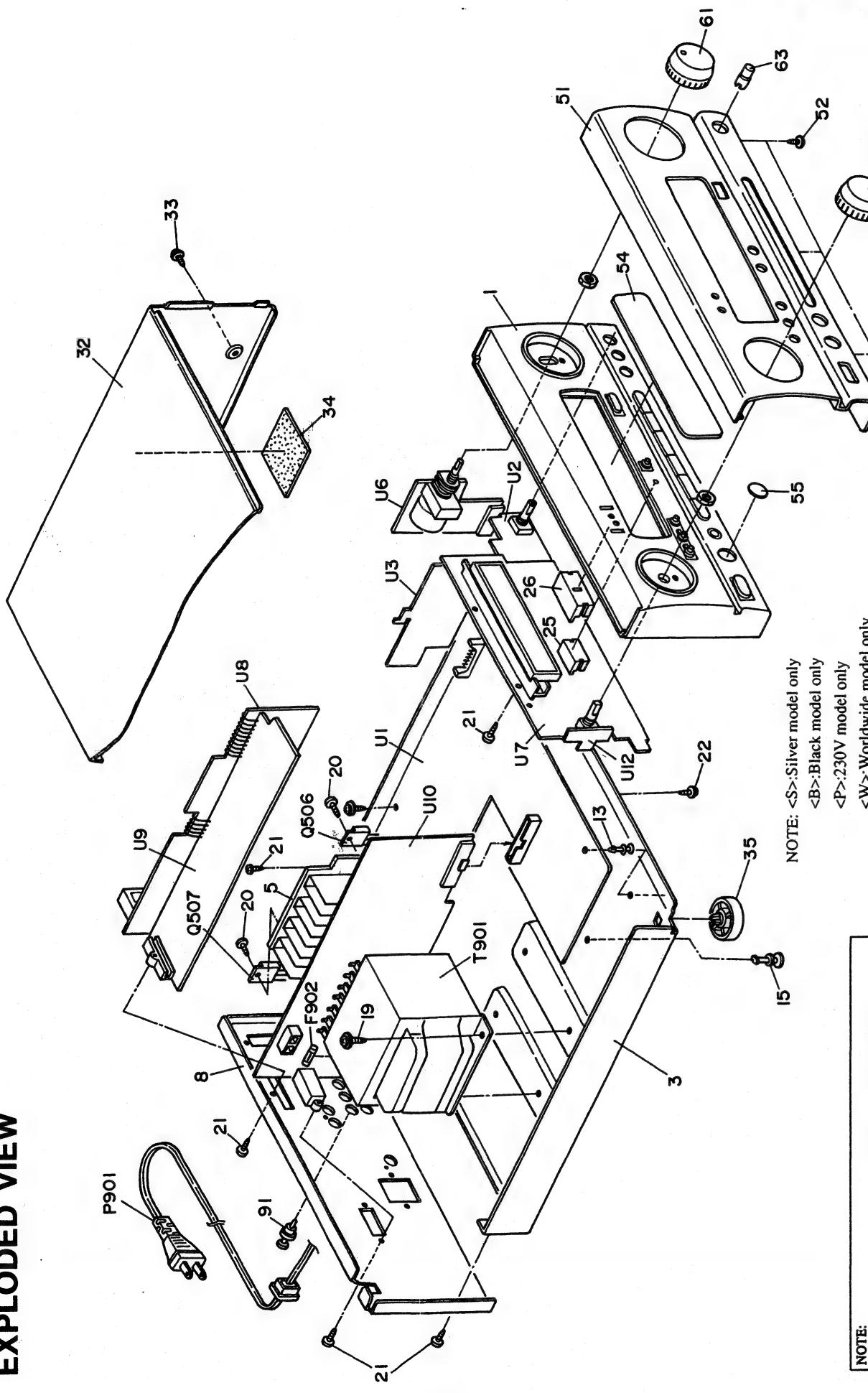


R-22/R-32 R-22/R-32

TERMINAL DESCRIPTION

Pin No.	Function	I/O	Description	Pin No.	Function	I/O	Description
1~7	7G~1G	O	Grid output terminal. On at the high level.	33	VSS		Ground terminal
8	VDD		Positive power source terminal (+5V)	34	X1		Resonator connection terminal for main system.
9	CL	O	Clock output terminal. Connect to the terminal CL of selector switch	35	X2		Connect the 4.19 MHz ceramic resonator.
10	DATA	O	Data output terminal. Connect to the terminal CL of PLL IC LM7001.	36,37	NC		Not used.
11	FCE	O	Chip enable output terminal. Connect to the terminal CE of selector switch LC7821N and the terminal DI of PLL IC LM7001.	38	FOUT	O	Output terminal for adjustment of oscillator frequency.
12	PLLCE	O	Chip enable output terminal. Connect to the terminal CE of PLL IC LM7001.	39	VIDEO-2V	O	Video signal selector terminal.
13	AMMEMORY	O	Control output terminal for automatically memory.	40	DIVEO-1V	O	Not used.
14	AM MONO	O	AM AUTO/MONO control terminal. Not used.	41	POWER	O	Control terminal for AC outlet relay.
15	VOLUP	O	VOLUME UP/DOWN control output terminals.	42	RELAY	O	Control terminal for speaker relay.
16	VOLDOWN	O	Refer to the table 1.	43	PROTECT	I	Detection input terminal for the protection circuit
17	RESET	I	System reset terminal. Low level when reset.	44	SYSOUT	O	System code output terminal
18	TUMUT	O	Muting control signal output terminal for tuner section.	45	POFF	I	Detection input for the power stoppage
19	INPMUT	O	Muting control signal output terminal for amplifier section.	46	SYSIN	I	System code input terminal
20	AVSS		Ground terminal for A/D converter.	47	REMIN	I	Remote control signal input terminal
21	SD	I	Broadcast detection input terminal.	48	IC		Internal connection terminal
22	STEREO	I	Stereo broadcast detection input terminal.	49	RESET	O	RESET LED control output
23	K2	I	PRESET/TUNING input terminal	50	TUNING	O	TUNING LED control output
24	AMMEMORY	I	Signal input terminal for automatically memory	51	LOUDNESS	O	LOUDNESS LED control output
25	AREA	I	Initializing input terminal for the band area	52	VDD		Positive power source terminal (+5V)
26	MODE	I	Initializing input terminal for operation mode	53~58	NC		Not used.
27	K1	I	Operation key input terminals.	59~70	P16~P5	O	Segment output terminal
28	K0	I		71	VLOAD		Pull-down resistor connection terminal for FL tube controller
29	AVDD		Power source terminal for A/D converter. +5V	72~75	P4~P1	O	Segment output terminals
30	AVREF		Reference voltage input terminal for A/D converter. +5V	76~80	12G~8G	O	Grid output terminals
31	XT1		Resonator connection terminal for sub system.				
32	XT2		Not used.				

EXPLODED VIEW



NOTE:
THE COMPONENTS IDENTIFIED BY MARK Δ ARE
CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK.
REPLACE ONLY WITH PART NUMBER SPECIFIED.

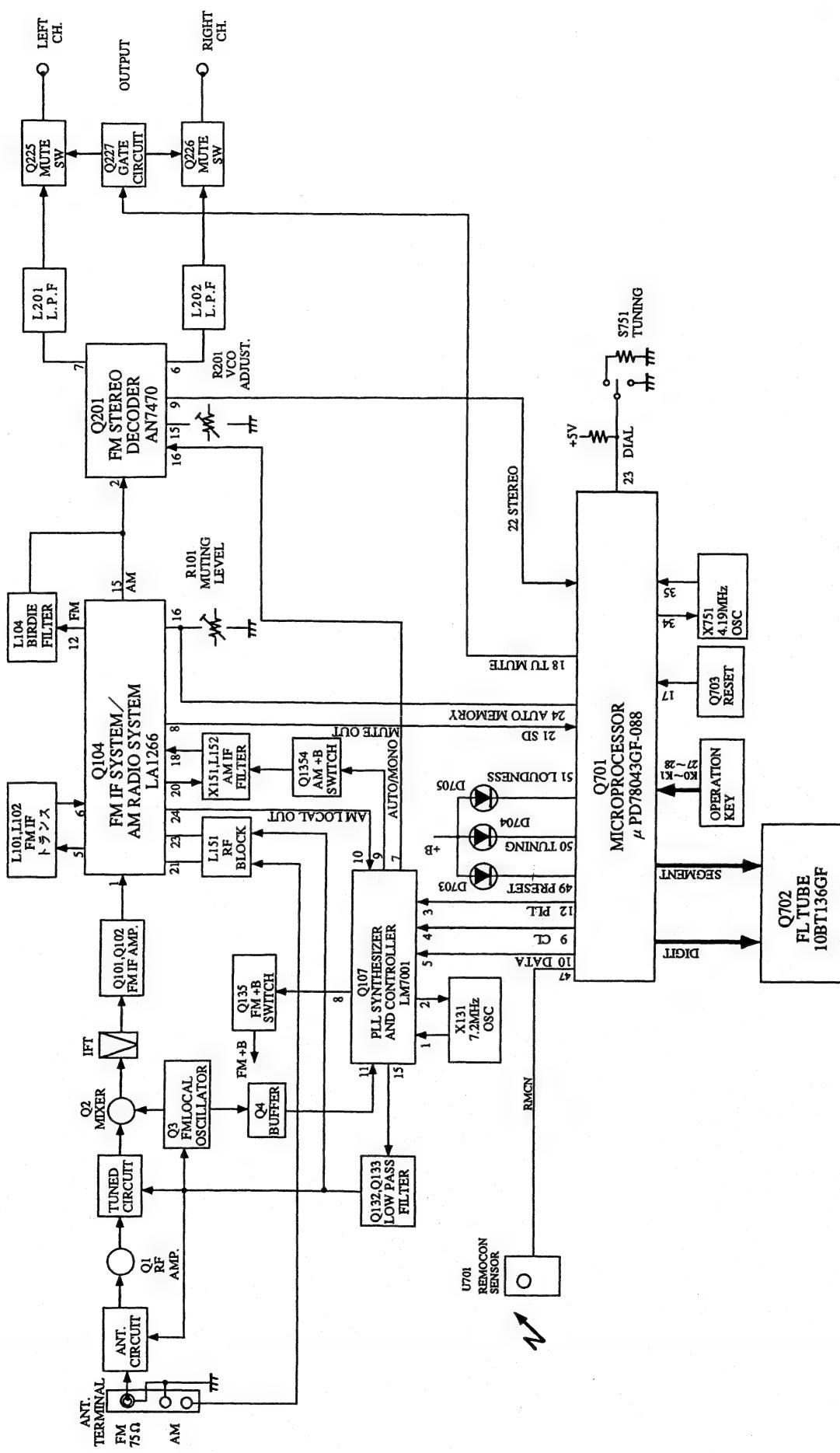
R-22/R-32 R-22/R-32

PARTS LIST

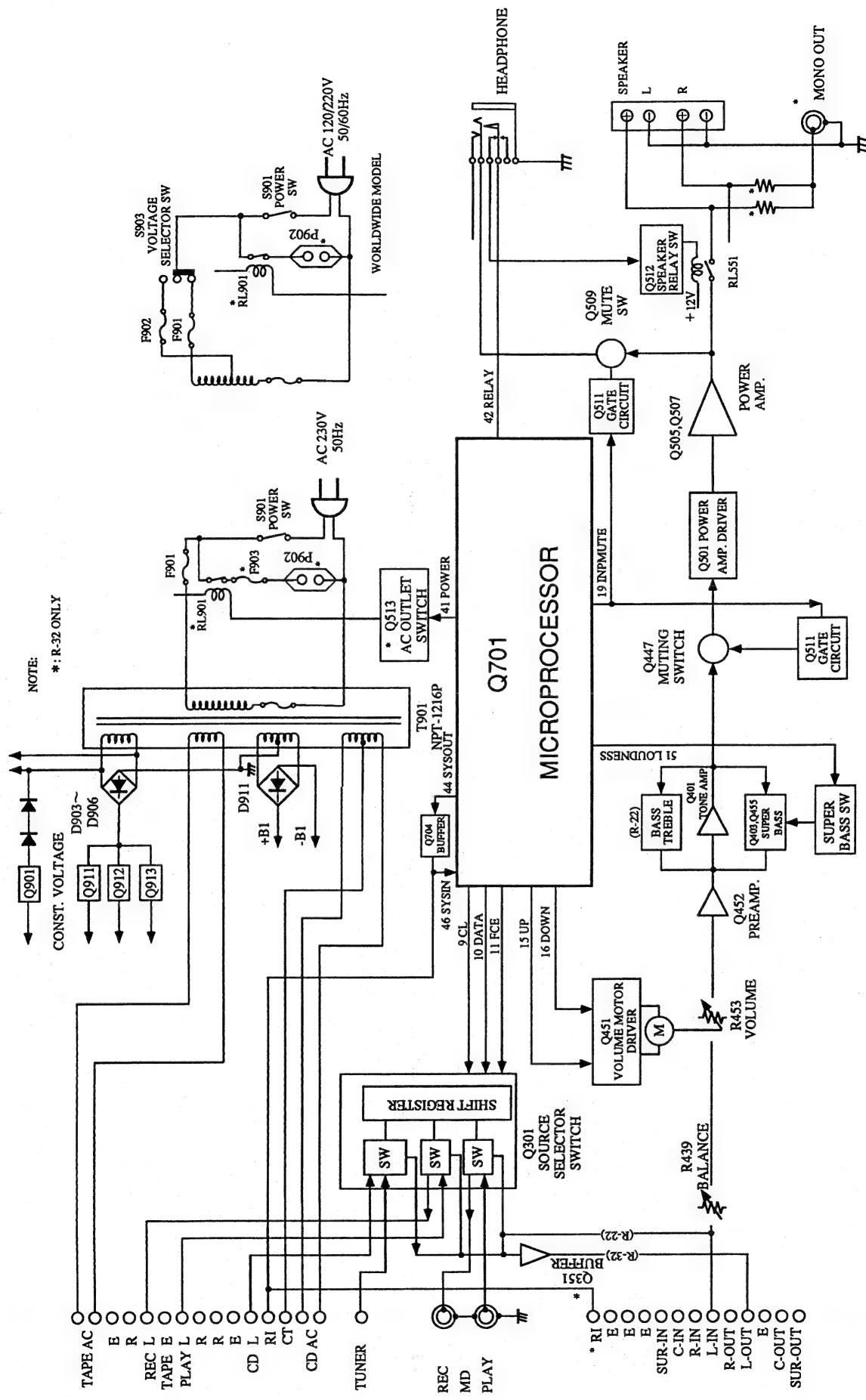
REF.NO.	PART NO.	Model DESCRIPTION	REF.NO.	PART NO.	Model DESCRIPTION
1	27110809	Front bracket <S>	P901	253207AHIT Δ	AS-CF,Power supply cord
	27110810	Front bracket 		253209AHIT Δ	AS-BS,Power supply cord <UK>
3	27100287	Chassis	Q505,Q506	2202303,	2SC4512-O,
5	27160338A	R-32 Radiator		2202304 or	2SC4512-Y or
8	27121900B	R-32 Rear panel <P>		2202305	2SC4512-P,Power transistors
	27121901B	R-32 Rear panel <W>	Q507,Q508	2202313,	2SA1726-Q,
	27121903B	R-22 Rear panel <P>		2202314 or	2SA1726-Y or
	27121904B	R-22 Rear panel <W>	T901	2301038A Δ	NPT-1210G,Power transformer <W>
13	27190524.	KGLS-14RF Holder		2202315	2SA1726-P,Power transistors
15	27190802	KGPS-14R Holder	U1	1A518514-1 Δ	NAAF-5014-1,Main circuit pc board ass'y <P>
19	830440089	4TTC+8C(BC),Self-tapping screw		1A518514-1A	NAAF-5014-1A,Main circuit pc board ass'y <W>
20	801433	3SMS8W SW+14SW+14B(BC),Sems screw		1A522514-2	NAAF-5014-2,Main circuit pc board ass'y <P>
21	838130088	3TTB+8B,Self-tapping screw		1A522514-2A	NAAF-5014-2A,Main circuit pc board ass'y <W>
22	831130088	3TTW+8B,Self-tapping screw	U2	1A518515-1 Δ	NAAETC-5015-1,Balance volume pc board ass'y
25	28198805	Facet		1A522515-2	R-32 NAAETC-5015-2,Balance volume pc board ass'y
26	28198806	Facet	U3	1A518516-1 Δ	R-32 NAAF-5016-1,Tone circuit pc board ass'y
32	28184565-1	Top cover <S>		1A522516-2	R-32 NAAF-5016-2,Tone circuit pc board ass'y
	28184564A	Top cover 	U5	1A518518-1	R-32 NAAETC-5018-1,Master volume pc board ass'y
33	834230108	3TTS+10B(NI),Nickel screw <S>		1A522518-2	R-32 NAAETC-5018-2,Master volume pc board ass'y
	838430088	3TTB+8B(BC),Self-tapping screw 	U7	1A518520-1	R-32 NADG-5020-1,FL tube pc board ass'y <P>
34	28140555-1	13×36×10,Cushion		1A518520-1A	R-32 NADG-5020-1A,FL tube pc board ass'y <W>
35	27175296A	Leg	U8	1A518521-1	R-32 NADG-5020-2,FL tube pc board ass'y <W>
51	27211616	R-32 Front panel <S>		1A522521-2	R-32 NARF-5021-1,Tuner circuit pc board ass'y <P>
	27211617	R-32 Front panel 	U9	1A518522-1	R-32 NARF-5021-2,Tuner circuit pc board ass'y <W>
	27211618	R-22 Front panel <S>		1A518522-1A	R-32 NAAAF-5022-1A,Stereo decoder pc board ass'y <W>
	27211619	R-22 Front panel 		1A522522-2	R-22 NAAAF-5022-2,Stereo decoder pc board ass'y <P>
52	838130088	3TTB+8B,Self-tapping screw	U10	1A522522-2A	R-22 NAAAF-5022-2A,Stereo decoder pc board ass'y <W>
	28191683	Clear plate		1A518523-1	R-32 NAPS-5023-1,R Power source pc board ass'y <P>
54	28191684	Knob VOLUME <S>		1A518523-1A	R-32 NAPS-5023-1A,R Power source pc board ass'y <W>
61	28324981	Knob VOLUME 		1A522523-2	R-22 NAPS-5023-2,R Power source pc board ass'y <P>
	28324982	Knob TUNING <S>		1A522523-2A	R-22 NAPS-5023-2A,R Power source pc board ass'y <W>
62	28324983	Knob TUNING 		1A518524-1	R-32 NASW-5024-1,Voltage selector switch pc board ass'y <W>
	28324984	Knob BALANCE <S>		1A522524-2	R-22 NASW-5024-2,Voltage selector switch pc board ass'y <W>
63	28324985	Knob BALANCE 		1A518533-1	R-32 NASW-5033-1,Tuning switch pc board ass'y <W>
	28324986	P-0107,Plug		1A522533-2	R-22 NASW-5033-2,Tuning switch pc board ass'y <P>
91	250153	1.25A-SE-EAK,Primary fuse			
F901	252071	△ 1.25A-SE-EAK,Primary fuse			
F902	252075	△ 2.5A-SE-EAK,Primary fuse <W>			
F903	252071	△ R-32 1.25A-SE-EAK,AC outlet fuse <P>			

BLOCK DIAGRAM

TUNER SECTION

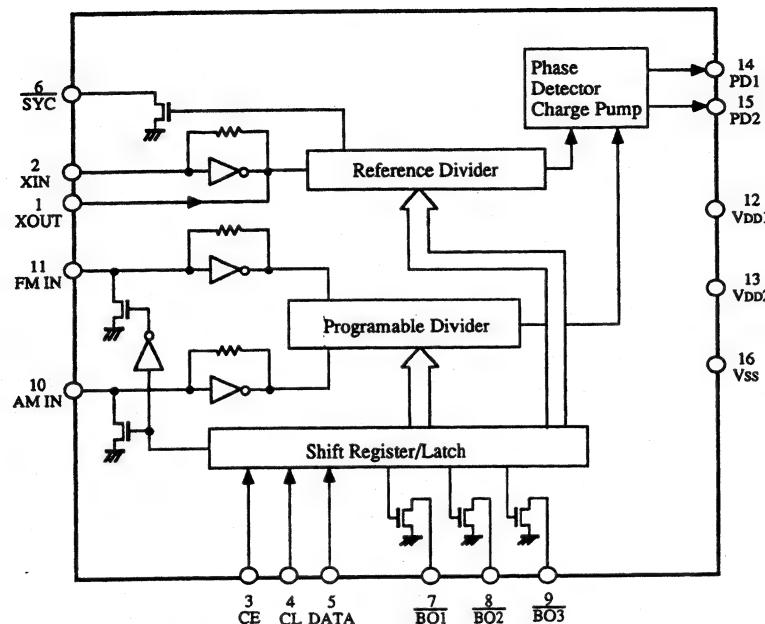


BLOCK DIAGRAM AMPLIFIER SECTION

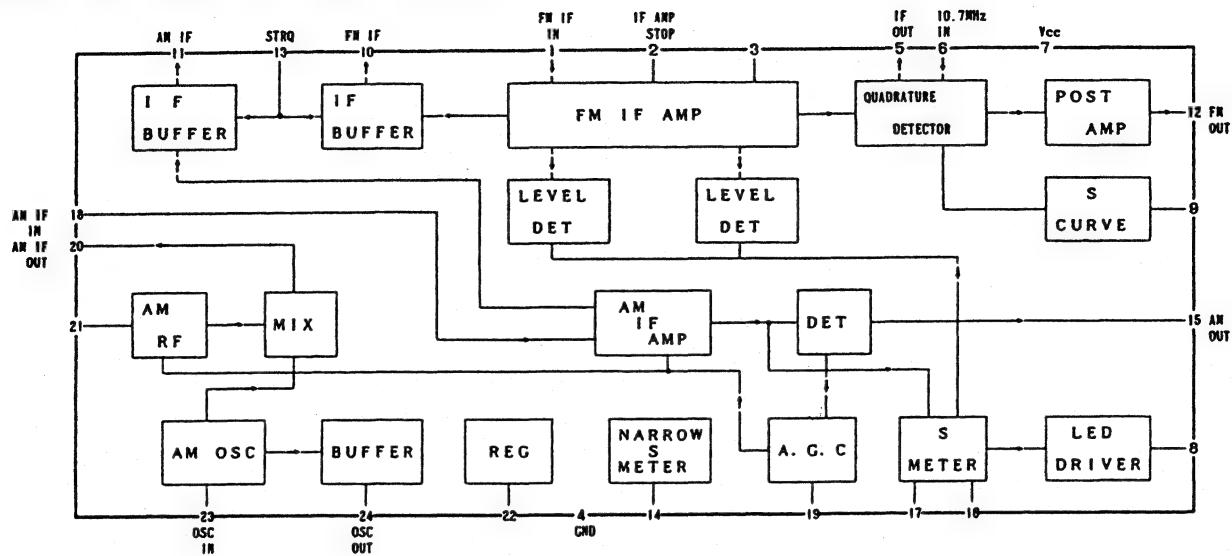
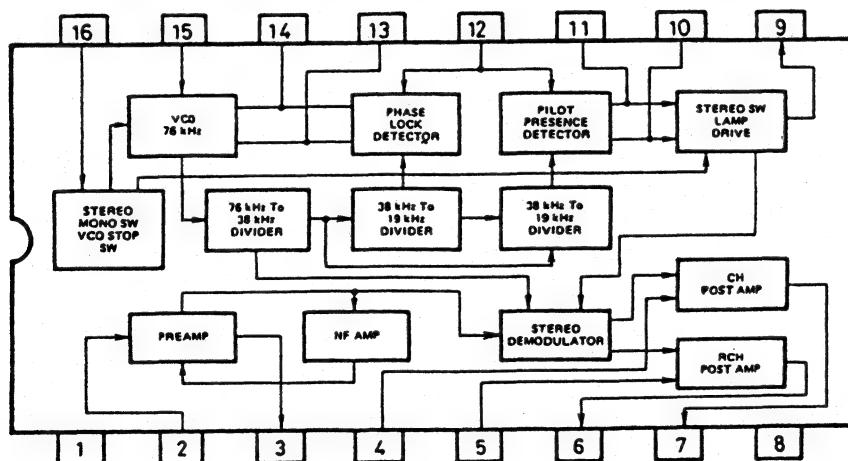


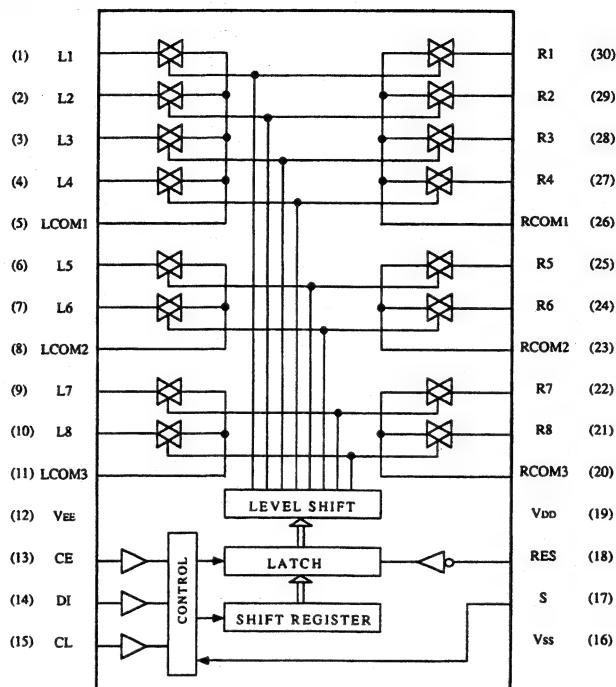
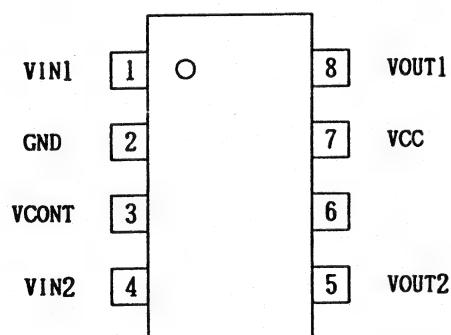
IC BLOCK DIAGRAMS AND DESCRIPTION

LM7001 (PLL Synthesizer and Controller)

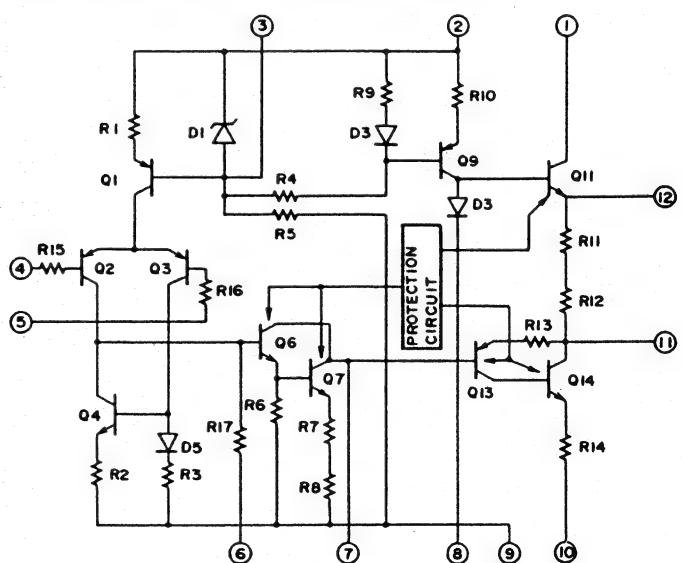


Pin No.	Terminal	Description
1	XOUT	Connect the 7.2MHz crystal resonator.
2	XIN	
3	CE	Chip enable terminal. Connect to the terminal PLL of the microprocessor.
4	CL	Serial clock input terminal. Connect to the terminal ACL of the microprocessor.
5	DATA	Serial data input terminal. Connect to the terminal ADA of the microprocessor.
6	SYN	Not used.
7	AUTO/MONO	AUTO/MONO selection terminal. Auto at the low level.
8	FM	FM selection terminal. FM at the low level.
9	AM	AM selection terminal. AM at the low level.
10	AMIN	AM local oscillator signal input terminal
11	FMIN	FM local oscillator signal input terminal
12	VDD1	Power supply terminal for back-up.
13	VDD2	Power supply terminal
14	PD1	Charge pump output terminal
15	PD2	Charge pump output terminal
16	Vss	Ground terminal

LA1266 (FM IF and AM Radio System)**AN7470 (FM Stereo Decoder)**

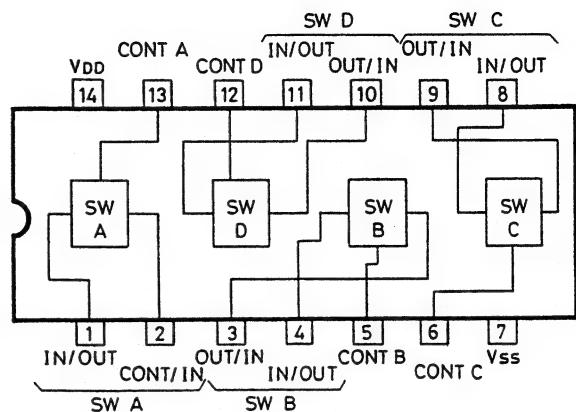
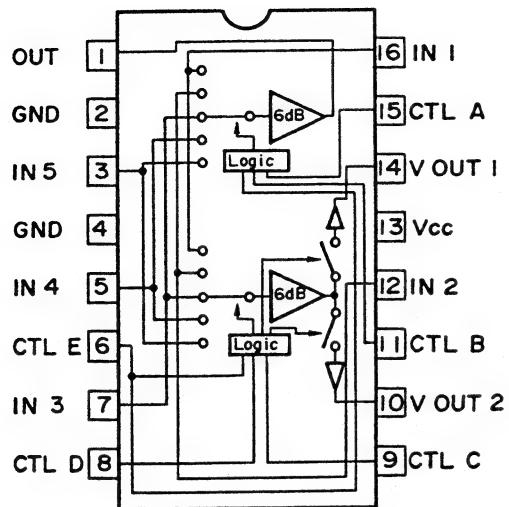
LC7821N (Analogue Switch)**LB1639 (Volume Motor Drive)**

VIN1	VIN2	VOUT1	VOUT2	
H	L	H	L	CD
L	H	L	H	CCD
H	H	OFF	OFF	STOP
L	L	OFF	OFF	STOP

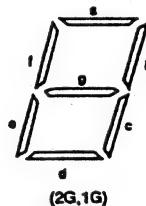
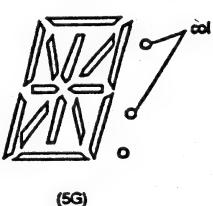
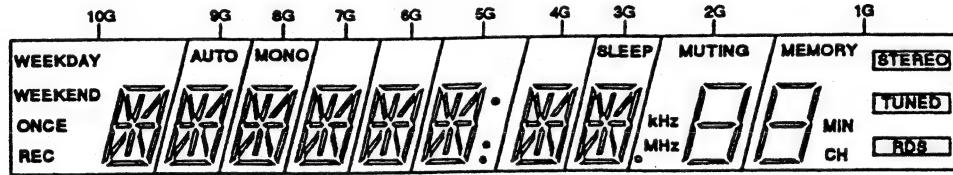
 μ PC1225H (Power Amplifier Driver)

BA7625 (Video Selector Switch)

LC4966



10BT-136GK (FL Tube)



	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	a	a	a	a	a	a	a	a	a	a
P2	b	b	b	b	b	b	b	b	b	b
P3	c	c	c	c	c	c	c	c	c	c
P4	d	d	d	d	d	d	d	d	d	d
P5	e	e	e	e	e	e	e	e	e	e
P6	f	f	f	f	f	f	f	f	f	f
P7	g	g	g	g	g	g	g	g	g	g
P8	h	h	h	h	h	h	h	h	h	-
P9	j	j	j	j	j	j	j	j	MUTING	MEMORY
P10	k	k	k	k	k	k	k	k	-	STEREO
P11	m	m	m	m	m	m	m	m	-	TUNED
P12	n	n	n	n	n	n	n	n	-	RDS
P13	p	p	p	p	p	p	p	p	-	-
P14	г	г	г	г	г	г	г	г	-	-
P15	WEEKDAY	AUTO	MONO	-	-	col	-	SLEEP	kHz	MIN
P16	WEEKEND	-	-	-	-	*	-	-	MHz	CH
P17	ONCE	-	-	-	-	-	-	-	*	-
P18	REC	-	-	-	-	-	-	-	-	-

ADJUSTMENT PROCEDURES

Preparation

• Input

FM mono: 1kHz, 75kHz devi., 60dB/ μ V
FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal
19kHz 7.5kHz devi.

AM: 400Hz, 30% mod.,

• Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

• Standard knob position

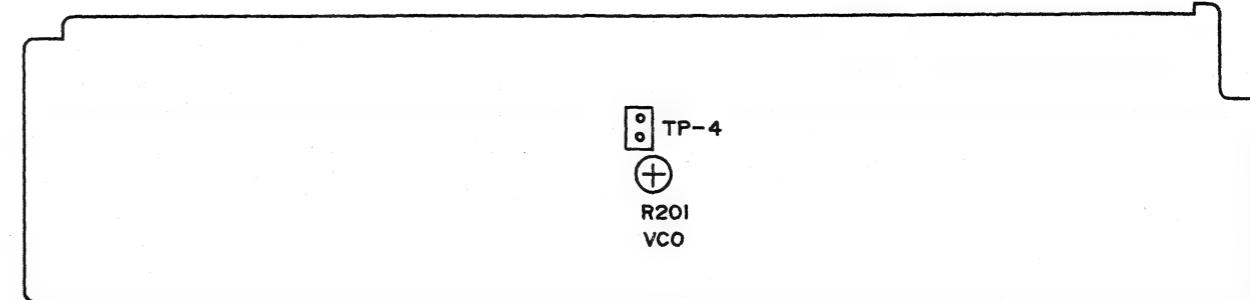
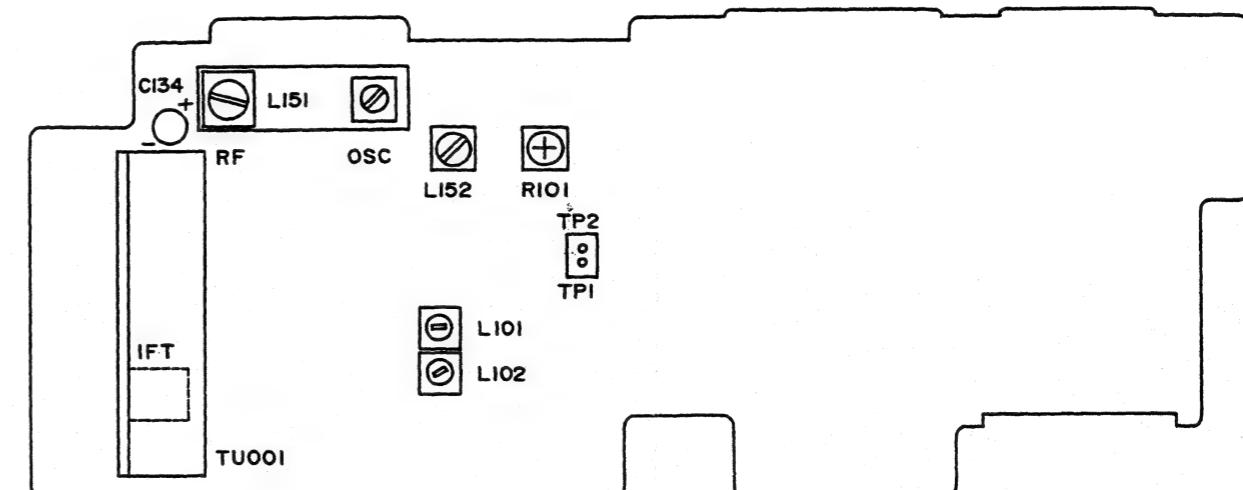
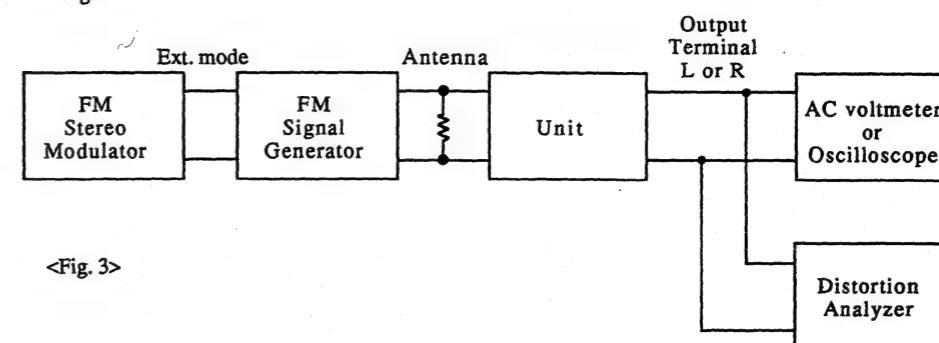
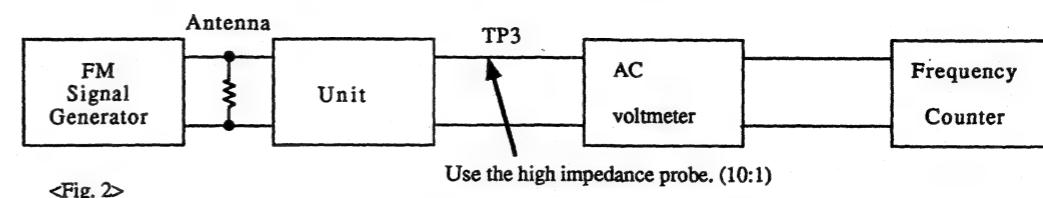
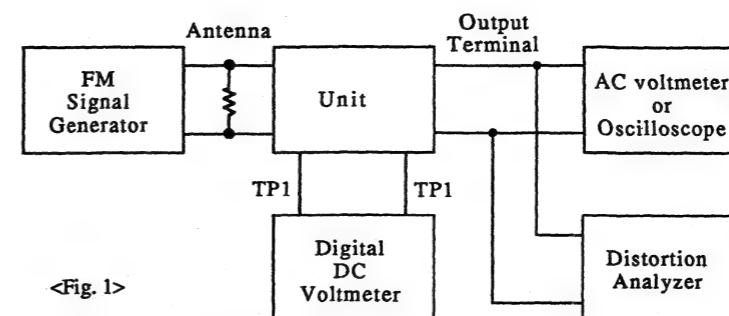
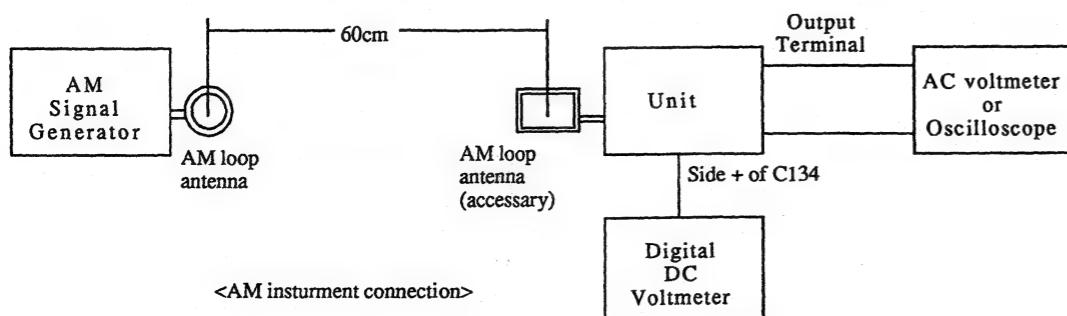
Input selector.....CD
VOLUME.....Maximum
BASS/TREBLE/S. BASS.....OFF
BALANCE.....CENTER

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM IF/RF	1	Fig.1	98.0MHz 1kHz 75kHz devi. 65dBf(60dB)	—	98.0MHz	DC voltmeter	L101	0±30mV	FM MUTE/MODE switch: OFF/MONO Repeat the steps 1 and 3 until no further adjustment is necessary.
	2					AC voltmeter	IFT on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
Muting Level		Fig.3	98.0MHz 17.2dBf(12dB)	—	98.0MHz	Oscilloscope	R101	Signal output	FM MUTE/MODE switch: ON/STEREO
VCO		Fig.2	98.0MHz 1kHz 75kHz devi. 65dBf(60dB)	—	98.0MHz	Frequency counter	R201	19kHz±10Hz	
Stereo Distortion		Fig.3	98.0MHz Ext. mod. 65dBf(60dB)	Channel L or R 1kHz	98.0MHz	Distortion analyzer	IFT on the front end	Minimum	Don't turn more than ±180°.

2. AM ADJUSTMENT

Step	AM SG output	Tuning Frequency	Output Indicator	Adjustment point	Adjust for
1		522kHz or 531kHz	Digital DC voltmeter	OSC coil on RF block L151	1.3±0.4V
2	603kHz 400Hz 30% mod. 60dB/m	603kHz	AC voltmeter	RF coil on RF block L151	Maximum
3	999kHz 400Hz 30% mod. 60dB/m	999kHz	AC voltmeter	L152	Maximum

Reference Specification
FM tuned voltage: 87.5MHz~108.0MHz
1.7±0.5V~7.5±0.5V
AM tuned voltage: 522kHz~161kHz
1.3±0.5V~7.5±0.5V
(230V model)
AM tuned voltage: 531kHz~160.2kHz
1.3±0.5V~7.5±0.5V
(Worldwide model)



PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-5014-1/1A/2/2A)			CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	
CIRCUIT NO.	PART NO.	DESCRIPTION										
		Resistors	R916	443521204	12 ohm±5%,1/2W,Metal oxide	C421,C422	374725634	0.056 μF±5%,50V,Plastic	R735	49121104412	100 kohm×12, Array	
	ICs		R918	443628204	82 ohm±5%,1W,Metal oxide	C425,C426	374723315	330pF±10%,50V,Plastic			Switches	
Q301	22240280	LC7821N	R919-R922	443622414	240 ohm±5%,1W,Metal oxide	C429,C430	393384799	0.47 μF,50V,Elect.	S701-S712	25035652	NPS-111-S604	
Q445	22240025	LC4966	R923	443624704	47 ohm±5%,1W,Metal oxide			Socket			Plugs	
Q452	22240191	NJM4565D-D	R924,R925	4400012U	30 ohm±5%,2W,Metal oxide	P402B	25051241	NSCT-20P1031	P701A	25055658	NPLG-9P614	
Q501,Q502	22240108	μPC1225H			Wire traps				P702A	25055657	NPLG-8P613	
Q911	222780055NEC	78M05HF	JL401B	25050271	NSCT-7P99 <R-22>			MASTER VOLUME PC BOARD (NAETC-5018-1/2)	P703A	25055660	NPLG-13P616	
Q912	222780125NEC	78M12HF	JL402A	25050267	NSCT-3P95						Jack	
Q913	222780565JRC	78M56	JL403A	25051107	NSCT-3P894 <R-32>				P705	25045396	LGT1516-0101	
		Transistors			Relay						Holder	
Q441,Q446	2212600	DTA124ES	RL501	25065339	NRL-2P5A-DC24-046	D451	22240322	LB1639,IC				
Q442	221282	DTC144ES			Plugs	D451	22380035 or	GP104003E or	P702A	27190943	FL tube	
Q443	2213290 or	DTC114ES or	P102A	25055709	NPLG-13P665	C452	354741009	10 μF,16V,Elect. capacitor				
	2214230	RN1202	P103A	25055707	NPLG-11P663 <R-32>	R452	5104339	N16RGM100KBT20F,Variable resistor				
Q447,Q448	2213631 or	RN1241-A or	P401A,P402A	25055712	NPLG-20P668	P401B	25051241	NSCT-20P131,Socket				
	2213632	RN1241-B									Front end	
Q503,Q504	2213284	2SC1740S-R	P911A	25055665	NPLG-17P621				TU001	240089	FE415-G11	
Q509,Q510	2212285	2SC2878-A	P912A	25055663	NPLG-12P619						ICs	
Q511	2212600	DTA124ES			Terminals				Q104	22240039	LA1266	
		Diodes	P301	25045410	NPJ-4PDML235	U701	24130010	HC-312	Q131	22240090	LM7001	
D501	223163,	1SS133,	P501	25060161	NTM-4PDML087						Transistors	
	223205 or	1SS270A or	P502	25045420	NPJ-1PDML245 <R-32>	Q701	22240794	μPD78043GF-088	Q101	2210746	2SC945A-P	
	223222	WG713A			Sockets	Q702	212131	10-BT-136GK	Q102	2211723	2SC1923-O	
D915,D916	224451303	MTZ13C	P302	25051247	NSCT-15P1037				Q132	2212445	2SK365-GR	
		Capacitors	P701B	25051045	NSCT-9P832	Q703	221282	DTC144ES	Q133	2213284 or	2SC1740S-R or	
C312,C313	354780339	3.3 μF,50V,Elect.	P702B	25051044	NSCT-8P831	Q704	2212600	DTA124ES		2212115	2SC2458-GR	
C453,C454	393380227	2.2 μF,50V,Elect.	P703B	25051047	NSCT-13P834				Q134,Q135	2213510 or	DTA114ES or	
C457,C458	374721015	100pF±10%,50V,Plastic			Switch	Q704	2212600	DTA124ES	Q227	2214350	RN2202	
C461	354742209	22 μF,16V,Elect.	S701	25065414	NSS-2215S <W>	D701	224450683	MTZ6.8C	Q225,Q226	2212794	2SD1468-R	
C501,C502	393380227	2.2 μF,50V,Elect.			BALANCE VOLUME PC BOARD (NAETC-5015-1/2)	D702	224450562	MTZ5.6B			Diodes	
C505,C506	354741019	100 μF,16V,Elect.			CIRCUIT NO. PART NO. DESCRIPTION	D706-D712	223205,	1SS270A,	D103	223205,	1SS270A,	
C509,C510	374723334	0.033 μF±5%,50V,Plastic	R437,R438	5104341	N14RHC100KWT20Z,Variable resistor <R-22>		223163 or	1SS133 or		223163 or	1SS133 or	
C511,C512	374721244	0.12 μF±5%,50V,Plastic	R439	5104342	N11RHC250KW20Z,Variable resistor		223222	WG713A		223222	WG713A	
C513,C514	374724734	0.047 μF±5%,50V,Plastic	JL401A	25051111	NSCT-7P898,Wire holder <R-22>	D703	225292D	SEL4310G-D	D131	224450512	MTZ5.1B	
C521,C522	354780229	2.2 μF,50V,Elect.	JL402A	25051107	NSCT-3P894,Wire holder	D704,D705	225291D	SEL4910D-D			Coils and transformers	
C915,C916	354761019	100 μF,35V,Elect.					X701	3010224	XTL-4.19M	L101	233401	NFIF-4072
C917,C918	354741009	10 μF,16V,Elect.						Coil	L102	233402	NFIF-4073	
C921	354762229	2200 μF,35V,Elect.				L701	233454K220	NCH-1452 220K	L103	233454M022	NCH-1452 022M	
C922	354761019	100 μF,35V,Elect.							L104	233383	NMC-6070	
C923	354741009	10 μF,16V,Elect.	Q401,Q403	22240191	NJM4565D-D				L151	232148	NMRF-7050	
C925,C926	354761019	100 μF,35V,Elect.	Q402	22240191	NJM4565D-D <R-22>	C701	353781009	10 μF,50V,Elect.	L152	232139	NMIF-4062	
C927,C928	354743319	330 μF,16V,Elect.				C704	3000075	0.047F, 5.5V, Super			Ceramic filters	
C931,C932	3504260	4700 μF,40V,Elect.	C401,C402	354780339	3.3 μF,50V,Elect.	C706	375524744	0.47 μF±5%,50V,Plastic	X101,X102	3010071	SFE10.7MA5	
		Resistors	C405,C406	374723315	330pF±10%,50V,Plastic	C709	354780109	1 μF,50V,Elect.	X103	3010130	SFE10.7MZ2A	
R331-R333	453530104	1 ohm±5%,1/2W,Metal	C411,C412	374721044	0.1 μF±5%,50V,Plastic	C710	354742209	22 μF,16V,Elect.	X151	3010123	SFZ-450JL	
R515,R516	4500027	0.22 ohm,2W,Metal plate	C413,C414	354780229	2.2 μF,50V,Elect. <R-22>	C714	354744709	47 μF,16V,Elect.	X153	3010076	BFU-450C	
R517,R518	453530824	8.2 ohm±5%,1/2W,Metal	C415,C416	374721044	0.1 μF±5%,50V,Plastic <R-22>	C715	354741009	10 μF,16V,Elect.	X131	3010141	XTL7.2M	
R527,R528	443523914	390 ohm±5%,1/2W,Metal oxide	C419,C420	374725624	5600pF±5%,50V,Plastic							
R915	443623904	39 ohm±5%,1W,Metal oxide										

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION			
		Capacitors			Capacitors			Plug			
C001	354741019	100 μ F,16V,Elect.	C217,C218	374724724	4700pF±5%,50V,Plastic <P>	P901A	25055713	NPLG-2P669			
C108	354741019	100 μ F,16V,Elect.		374725624	5600pF±5%,50V,Plastic <W>	P903	25050410	△ NSCT-2P235 <R-32>			
C112	354780229	2.2 μ F,50V,Elect.	C220	374724734	0.047 μ F±5%,50V,Plastic			Sockets			
C113	354784799	0.47 μ F,50V,Elect.	C359,C360	354741009	10 μ F,16V,Elect. <R-32>	P911B	25051054	NSCT-17P841			
C132	374723334	0.033 μ F±5%,50V,Plastic			Resistor	P912B	25051052	NSCT-12P839			
C133	354780229	2.2 μ F,50V,Elect.	R201	5210261	N06HR5KBC,Trim	RL901	25065341	△ NRL-1P15A-DC24-047			
C134	354782299	0.22 μ F,50V,Elect.			Socket	S901	25035550	Switch			
C138,C152	354721019	100 μ F,6.3V,Elect.	P201	25051245	NSCT-13P1035 <R-32>			△ NPS-111-L512P			
C139	354741019	100 μ F,16V,Elect.			Plug						
C154	354780479	4.7 μ F,50V,Elect.	JL403B	25055038	NPLG-2P29						
C155-C157	354741009	10 μ F,16V,Elect.			POWER SOURCE PC BOARD (NAPS-5023-1/1A/2/2A)			VOLTAGE SELECTOR SWITCH PC BOARD (NASW-5024-1/2)			
C160	374721034	0.01 μ F±5%,50V,Plastic			CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	
C161	354782299	0.22 μ F,50V,Elect.			CIRCUIT NO.	PART NO.	DESCRIPTION	S903	25065437	△ NSS-22157P,Slide switch	
C227	354780229	2.2 μ F,50V,Elect.			Transistors					TUNING SWITCH PC BOARD (NASW-5033-1/2)	
		Resistor	Q512,Q513	2213650	DTD113ZS	CIRCUIT NO.	PART NO.	DESCRIPTION	S751	25030376	NRSF-112-20F,Rotary switch
R101	5210266	N06HR100KBC,Trim	Q901	2211455	2SA1015-GR						
		Terminal			Diodes						
P101	25060197	NTM-2PDMN119	D901	223205,	1SS270A,						
		Sockets		223163 or	1SS133 or						
P102B	25051238	NSCT-13P1028		223222	WG713A <R-32>						
P103B	25051236	NSCT-11P1026	D903-D910	22380046 or	AM01Z or						
		Plug		22380035	GP104003E						
TP101	25055038	NPLG-2P29	D911	22380022F	RBV402						
			D912	224452704	MTZ27D						
			D913	224451203	MTZ12C						
		STEREO DECODER PC BOARD (NAAF-5022-1/1A/2/2A)			Capacitors						
		CIRCUIT NO.	PART NO.	DESCRIPTION							
		ICs	C901	3500065A	△ DE7150FZ103P1C400V/125V,IS						
Q201	22240242	AN7470	C902	3500065A	△ DE7150FZ103P1C400V/125V,IS <P> <R-32>						
Q351	22240191	NJM4565D-D <R-32>	C906	354784709	47 μ F,50V,Elect.						
		Diodes	C908	354780339	3.3 μ F,50V,Elect.						
D201-D203	223205,	1SS270A,	C909-C911	354781019	100 μ F,50V,Elect.						
	223163 or	1SS133 or	C912,C913	354771019	100 μ F,63V,Elect.						
	223222	WG713A	C951,C952	374721044	0.1 μ F±5%,50V,Plastic						
		Coils			Resistors						
L201,L202	233355A	NMC-4059	R901	453534794	0.47 ohm±5%, 1/2W,Metal						
		Capacitors	R902,R903	443521024	1 kohm±5%, 1/2W,Metal oxide						
C201	354744719	470 μ F,16V,Elect.	R904	443522704	27 ohm±5%, 1/2W,Metal oxide						
C202	354742209	22 μ F,16V,Elect.	R907,R908	4400012U	30 ohm±5%, 2W,Metal oxide						
					Fuses						
C205	354782299	0.22 μ F,50V,Elect.	F901	252071	△ 1.25A-SE-EAK,Primary						
C206	354780109	1 μ F,50V,Elect.	F902	252075	△ 2.5A-SE-EAK,Primary <W>						
C207	354780339	3.3 μ F,50V,Elect.	F903	252071	△ 1.25A-SE-EAK,AC outlet <P> <R-32>						
C208	370134714	470pF±5%,50V,Plastic			Fuseholders						
C209	374724734	0.047 μ F±5%,50V,Plastic									
C211,C212	374721224	1200pF±5%,50V,Plastic <P>	F901A	25050065	△ YSH403T						
	374721524	1500pF±5%,50V,Plastic <W>	F902A	25050065	△ YSH403T <W>						
C213,C214	354742209	22 μ F,16V,Elect.	F903A	25050065	△ YSH403T <P> <R-32>						
C215,C216	354741009	10 μ F,16V,Elect.	C901A	27301216	Cover						
					△ for C901 <P>						

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

Circuit No. Part No. Description

F901	252071	1.25A-SE-EAK, Primary fuse
F902	252075	2.5A-SE-EAK, Primary fuse <W>
F903	252073	1.6A-SE-EAK, AC outlet fuse <P>

NOTE: <P> : Only 230V model

<W> : Only Worldwide model

2. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

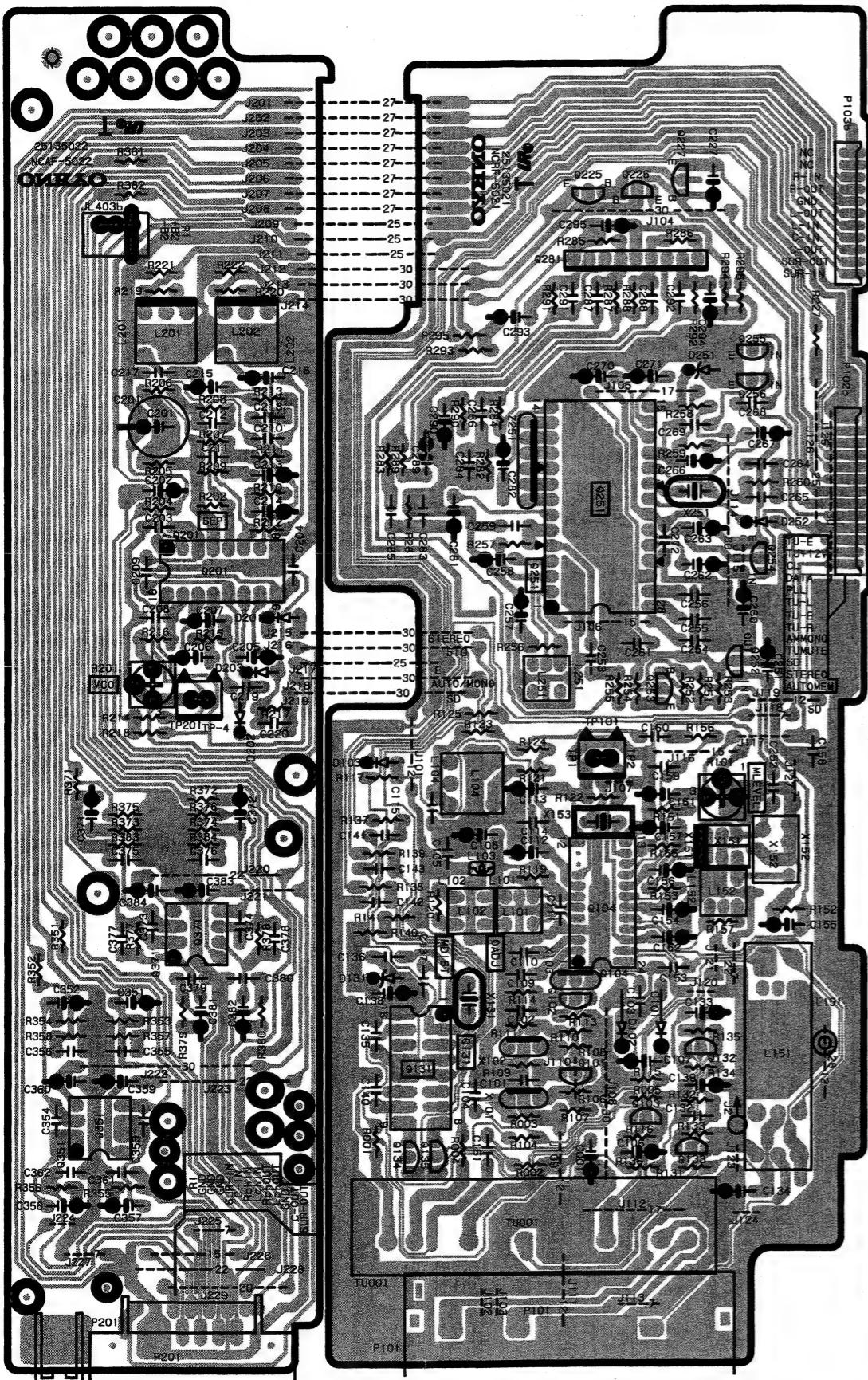
3. Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

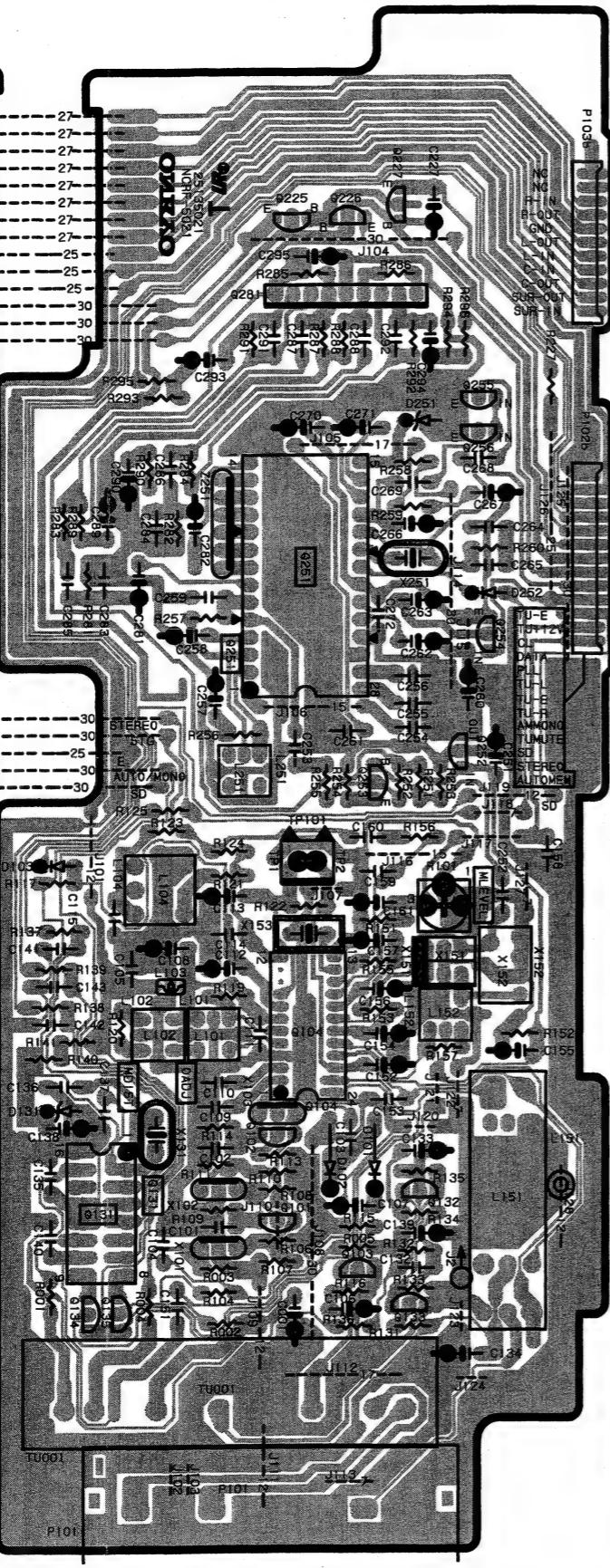
This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

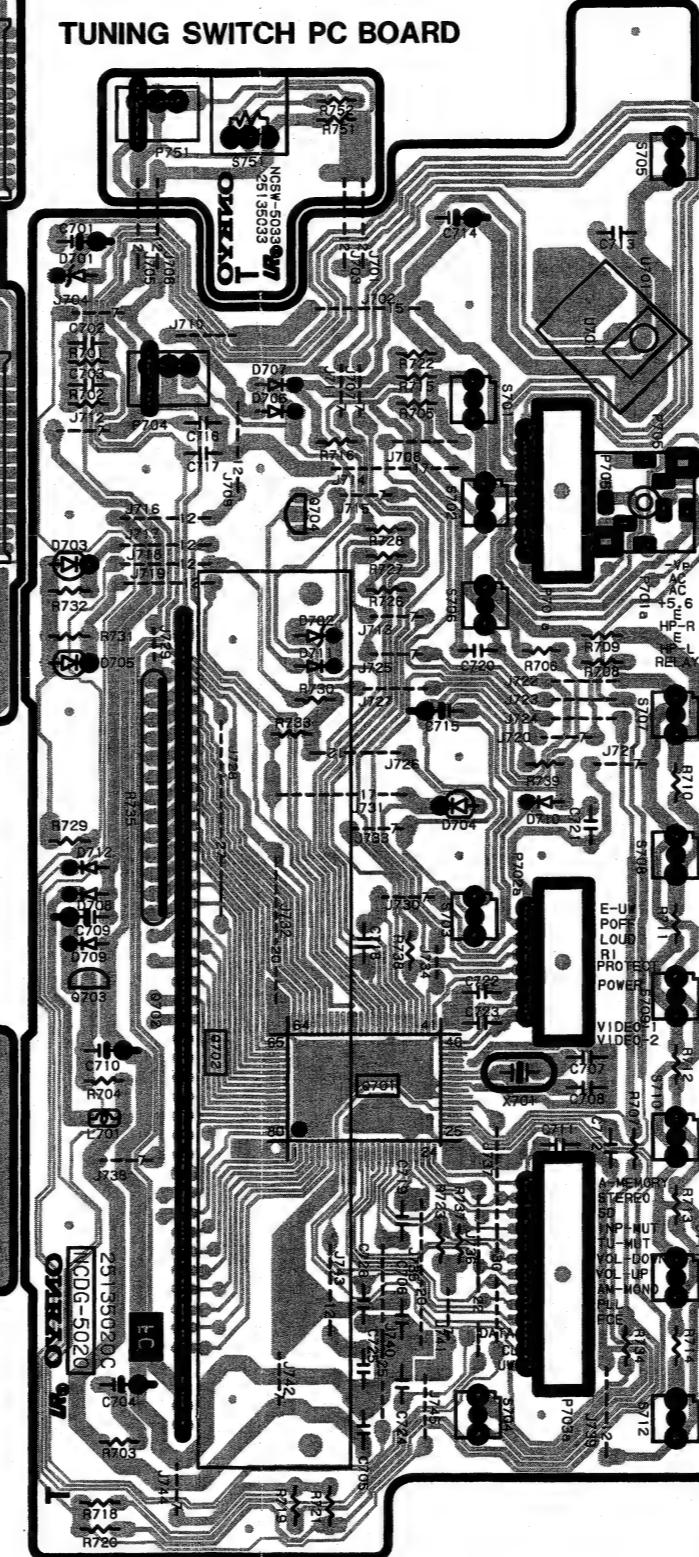
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



STEREO DECODER PC BOARD

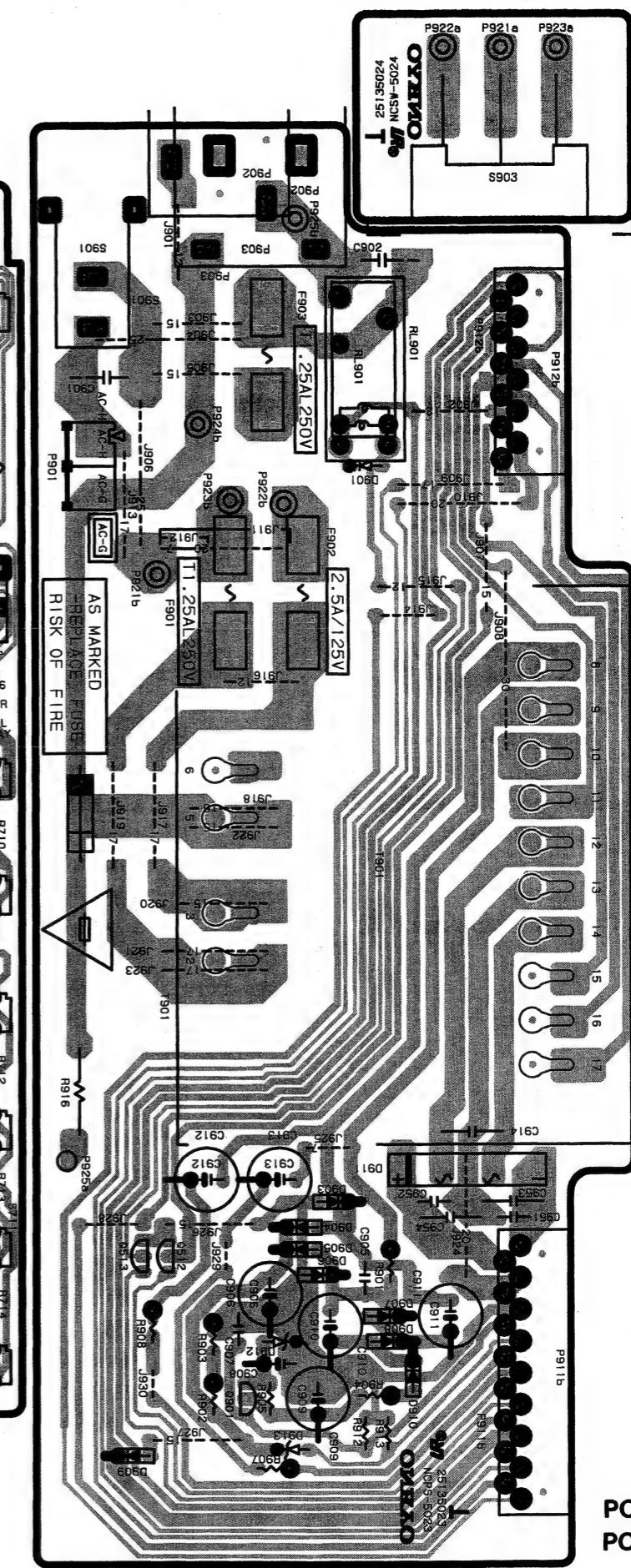


TUNER CIRCUIT PC BOARD

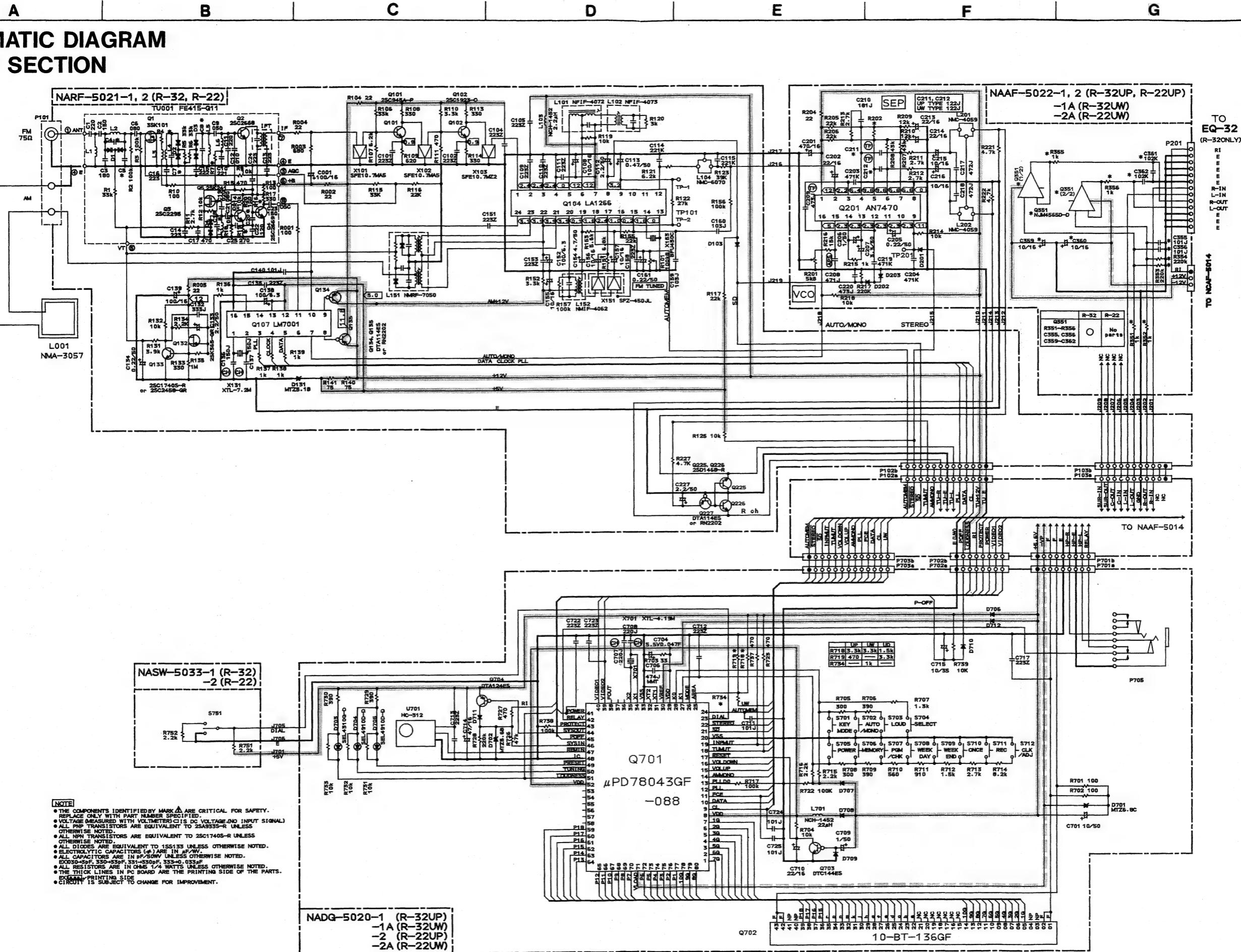


FL TUBE PC BOARD

VOLTAGE SELECTOR SWITCH PC BOARD

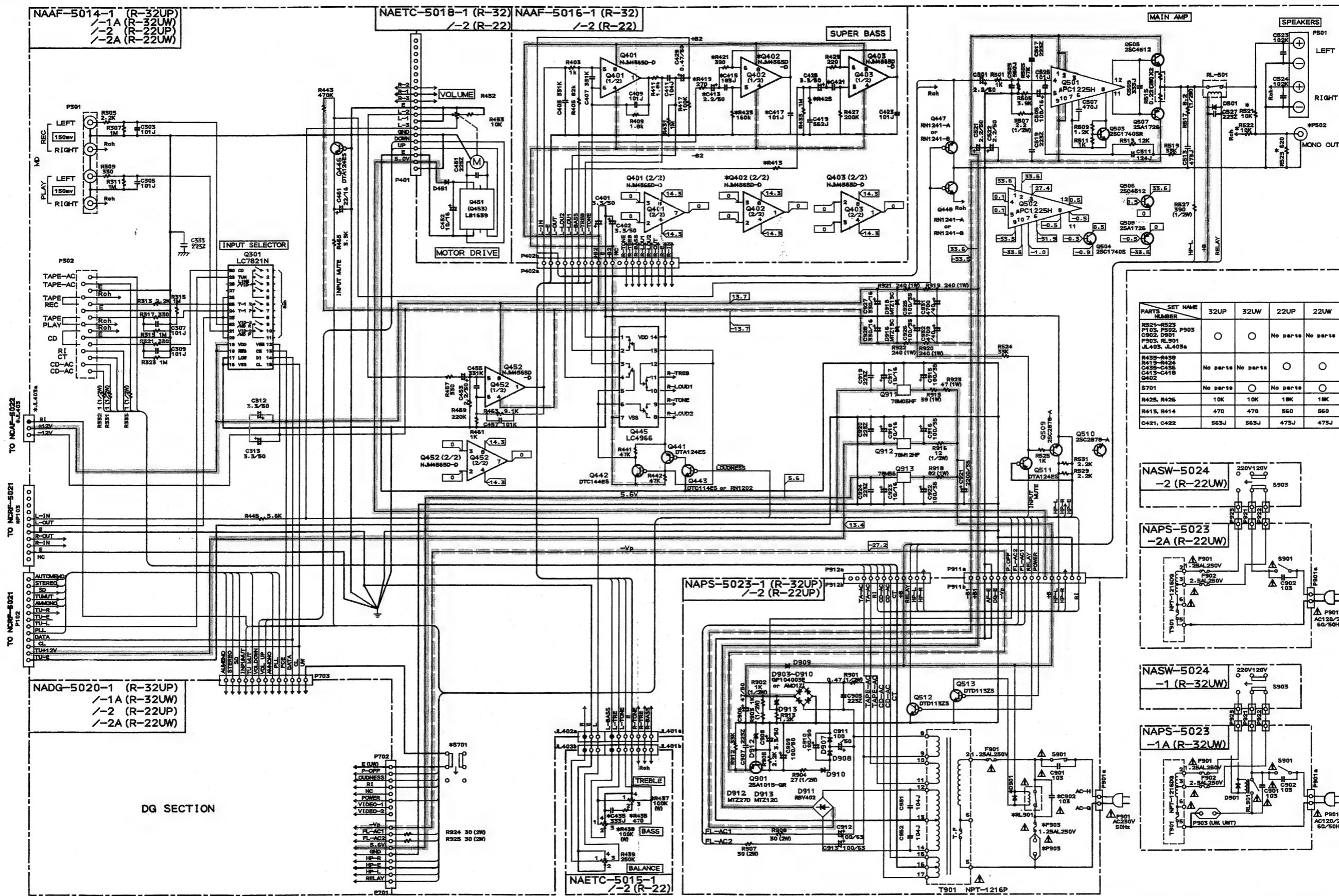


POWER SOURCE PC BOARD



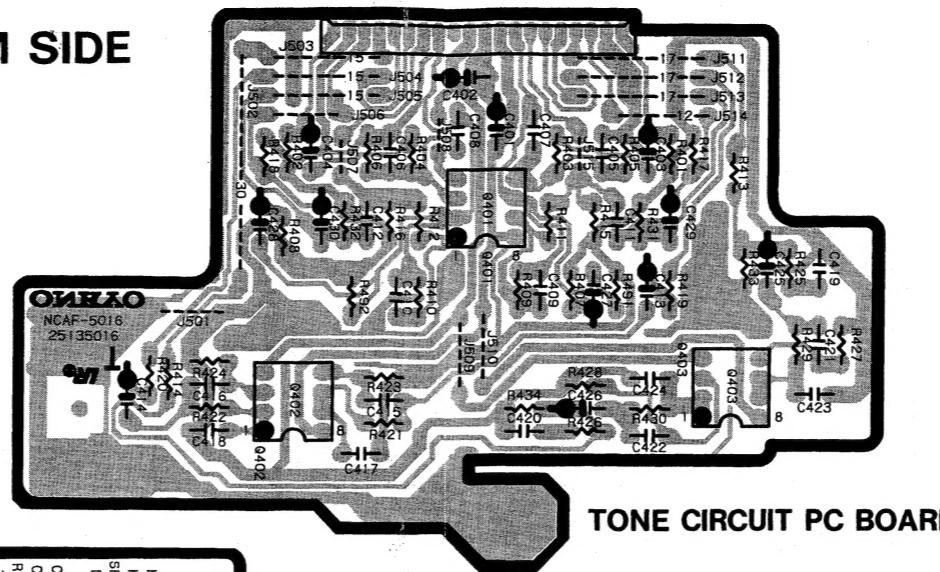
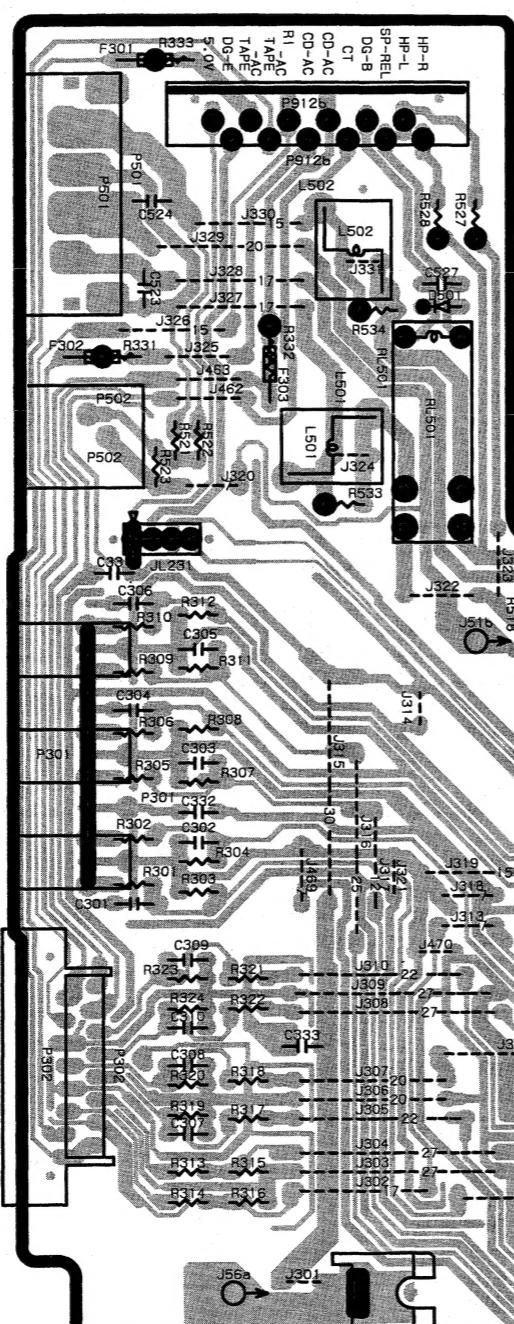
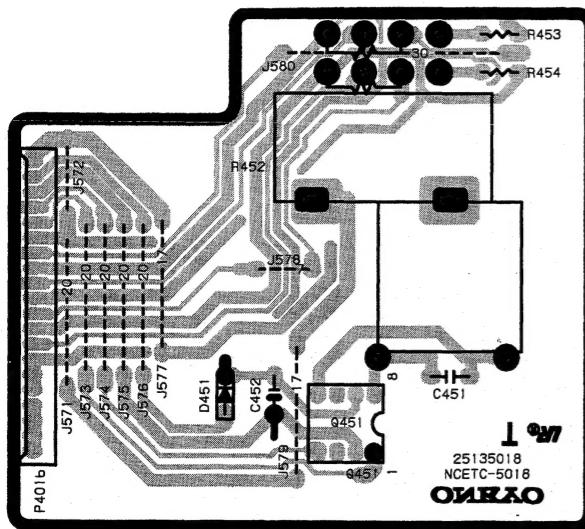
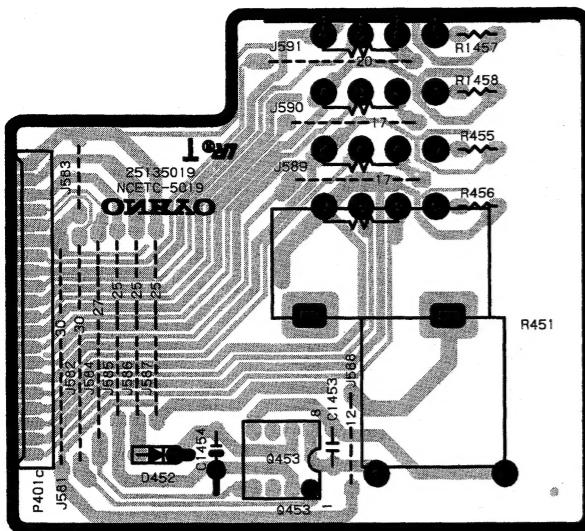
A **B** **C** **D** **E** **F** **G** **H**

SCHEMATIC DIAGRAM AMPLIFIER SECTION



ONKYO CORPORATION

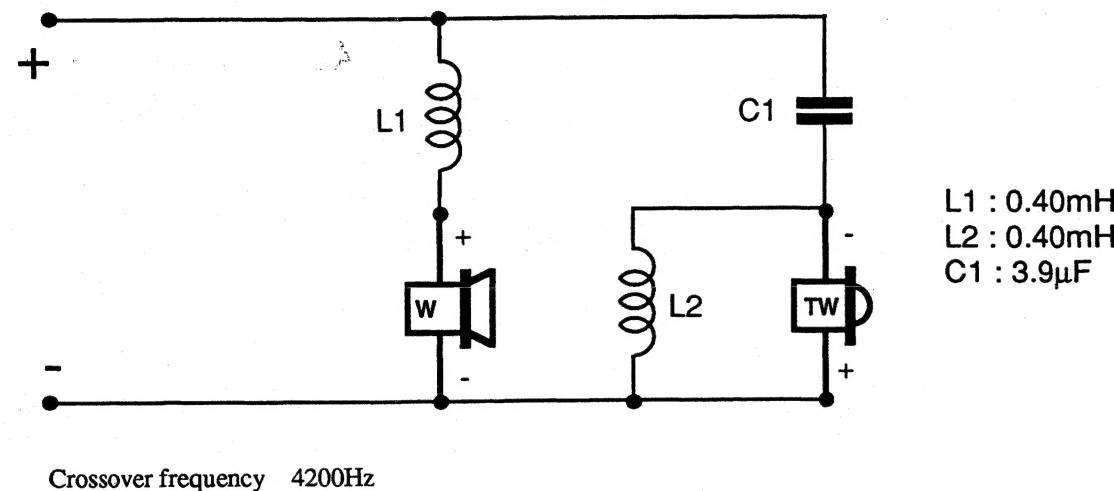
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



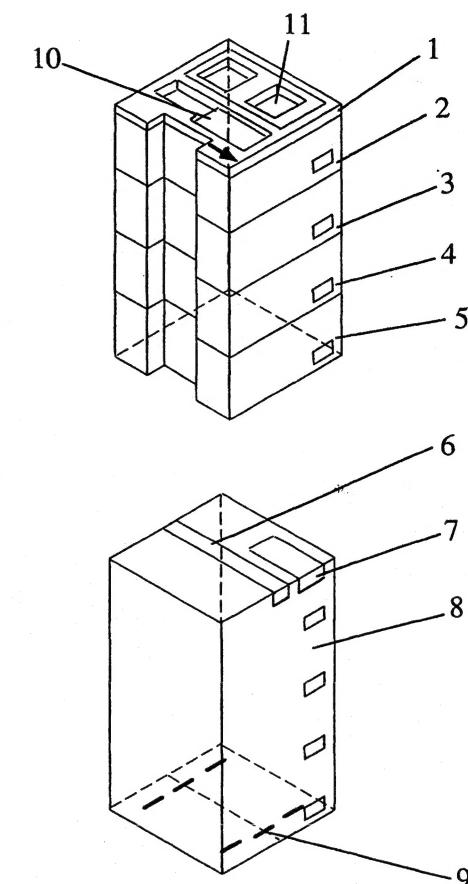
PS-32 1. PARTS LIST

DESCRIPTION	PART NO.
Loudspeaker a'ssy	BEE1211A
Box a'ssy	BXAS490A
Grill a'ssy	DLAS1235
Badge	MK377

2. SCHEMATIC DIAGRAM



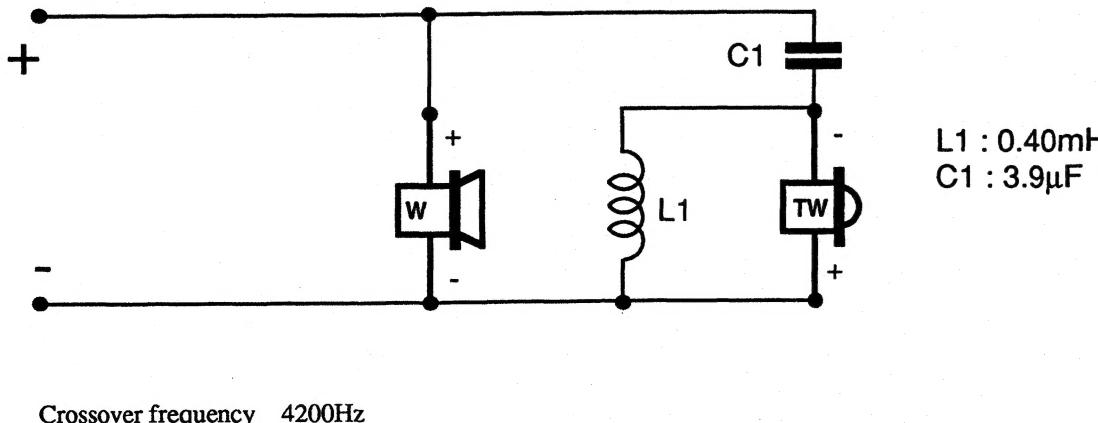
PACKING VIEW



PS-22 1. PARTS LIST

DESCRIPTION	PART NO.
Loudspeaker a'ssy	BEE1210A
Badge	28135197A

2. SCHEMATIC DIAGRAM



Ref. No.	Part Name	MP-22SUP	MP-22SUPV	MP-22SUW	MP-22BUP	MP-22BUPV	MP-22BUW	MP-32SUP	MP-32SUPV	MP-32SUW	MP-32BUP	MP-32BUPV	MP-32BUW
1	Pad F	29091669	←	←	←	←	←	←	←	←	←	←	←
2	Equalizer							EQ-32SUP		EQ-32SUW	EQ-32BUP		EQ-32SUW
	Styren bag							29100037-1Y		29100037-1Y			
	Pad							29091667	←	←	←	←	←
								29091670	←	←	←	←	←
3	Cassette Deck	K-22SU	←	←	K-22BU	←	←	K-32SUP	←	←	K-32BUP	←	←
	Styren bag	29100037-1Y	←	←	←	←	←	29091667	←	←	←	←	←
	Pad	29091668A	←	←	←	←	←	29091670	←	←	←	←	←
4	CD Player	C-32SU	←	←	C-32BU	←	←	C-32SUP	←	←	C-32BUP	←	←
	Styren bag	29100037-1Y	←	←	←	←	←	29091667	←	←	←	←	←
	Pad	29091667	←	←	←	←	←	29091670	←	←	←	←	←
5	Tuner Amplifier	R-22SUP	←	R-22SUW	R-22BUP	←	R-22BUW	R-32SUP	←	R-32SUW	R-32BUP	←	R-32BUW
	Styrene bag	29100037-1Y	←	←	←	←	←	29091670	←	←	←	←	←
	Pad	29091668A	←	←	←	←	←	29091670	←	←	←	←	←
6	PP tape	29110071	←	←	←	←	←	29091670	←	←	←	←	←
7	Warranty card		29365020J			29365020J		29365020J		29365020J			
	Bag for warranty card		29100094B			29100094B		29100094B		29100094B		29100094B	
8	Carton box	29052775A	←	←	29052776A	←	←	29052773A	←	←	29052774A	←	←
9	Staples	282321	←	←	←	←	←	29052773A	←	←	29052774A	←	←
10	Remote control(RC-271S)	24140271	←	←	←	←	←	29052773A	←	←	29052774A	←	←
11	Accessory bag ass'y												
	Instruction manual U3	29341969	←	←	←	←	←	29052773A	←	←	29052774A	←	←
	Instruction manual U2	29341970			29341970			29052773A	←	←	29052774A	←	←
	Instruction manual U2	29341971			29341971			29052773A	←	←	29052774A	←	←
	FM antenna	292112	←	←	←	←	←	29052773A	←	←	29052774A	←	←
	AM loop antenna	232140	←	←	←	←	←	29052773A	←	←	29052774A	←	←
	Two batteries	30100054	←	←	←	←	←	29052773A	←	←	29052774A	←	←
	Connection cord (4SP)	2009990332	←	←	←	←	←	29052773A	←	←	29052774A	←	←
	Connection cord (26P)							29052773A	←	←	29052774A	←	←
	Conversion plug							29052773A	←	←	29052774A	←	←
	FM antenna adaptor							29052773A	←	←	29052774A	←	←
	Styren bag	29100097-1Y	←	←	←	←	←	29052773A	←	←	29052774A	←	←

SPECIFICATIONS

Tuner Amplifier R-32/22

Amplifier section

Power Output:	30 watts per channel min. RMS. at 6 ohms both channels driven, from 40 Hz to 20 kHz with no more than 0.5% THD.
Continuous Power Output:	2 x 35 watts at 6 ohms, 1 kHz (DIN)
Total Harmonic Distortion:	0.5% at rated power
IM Distortion:	0.5% at rated power
Damping Factor:	40 at 6 ohms
Frequency Response:	40 – 20,000 Hz ± 3 dB
Sensitivity and Impedance:	
CD/Tape Play:	150 mV/50 kohm
Tape Rec:	150 mV/2.2 kohms
Signal-to-Noise Ratio:	
CD/Tape:	100 dB (IHF-A)
Tone Controls:	
Super Bass:	+ 10 dB at 60 Hz
Bass:	± 10 dB at 100 Hz
Treble:	± 10 dB at 10 kHz
Muting:	- 45 dB

Tuner section:

FM:

Tuning Range:	
European models:	87.5 – 108.0 MHz (50 kHz steps)
Worldwide models:	87.5 – 108.0 MHz (50 kHz steps)
	87.9 – 107.9 MHz (200 kHz steps)
Usable Sensitivity:	
Mono:	11.2 dBf, 1.0 µV, 75 ohms 0.9 µV (S/N 26 dB, 40 kHz Devi.) 75 ohms DIN
Stereo:	18.0 dBf, 2.2 µV, 75 ohms 23 µV (S/N 46 dB, 40 kHz Devi.) 75 ohms DIN
50 dB Quieting Sensitivity:	
Mono:	18.2 dBf, 2.2 µV, 75 ohms
Stereo:	37.2 dBf, 20 µV, 75 ohms
Capture Ratio:	1.5 dB
Image Rejection Ratio:	85 dB (European and worldwide models) 40 dB (USA and Canadian models)
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio:	
Mono:	73 dB
Stereo:	66 dB
Selectivity:	50 dB DIN (± 300 kHz, 40 kHz Devi.)
AM Suppression Ratio:	50 dB
Harmonic Distortion:	
Mono:	0.15%
Stereo:	0.30%
Frequency Response:	30 – 15,000 Hz ± 1.5 dB
Stereo Separation:	40 dB at 1 kHz

AM:

Tuning Range:	
European models:	522 – 1611 kHz (9 kHz steps)
Worldwide models:	531 – 1602 kHz (9 kHz steps)
	530 – 1710 kHz (10 kHz steps)
Usable Sensitivity:	30 µV
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	40 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.8 %

General

Power Supply:	
European model:	AC 230 V, 50 Hz
Worldwide models:	AC 120 and 220 V switchable, 50/60 Hz
Dimensions:	275 (W) x 118 (H) x 321 (D) mm 10-13/16" x 4-5/8" x 12-5/8"
Mass:	5.3 kg (11.7 lbs.)

CD player C-32

Signal readout system:	Optical non-contact
Reading rotation:	About 500 – 200 r.p.m. (constant linear velocity)
Linear velocity:	1.2 – 1.4 m/s
Error correction system:	Cross Interleave Reed-Solomon code
D/A converter:	1 BIT PWM
Sampling frequency:	352.8 kHz (8 times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5 Hz – 20 kHz
Harmonic distortion:	0.005 % (at 1 kHz)
Dynamic range:	96 dB
Signal to noise ratio:	90 dB
Channel separation:	90 dB (at 1 kHz)
Wow and Flutter:	Below threshold of measurability
Dimensions:	275 (W) x 79 (H) x 308 (D) mm 10-13/16" x 3-1/8" x 12-1/8"
Mass:	2.3 Kg (5.1 lbs.)

Cassettedeck K-32/22

Track System:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.) 9.6 cm/sec. (3-3/4 i.p.s.) (high speed dubbing)
Wow and Flutter.	0.09% (WRMS)
Frequency Response:	20 – 15,000 Hz (Normal) (30 – 14,000 Hz ± 3 dB) 20 – 16,000 Hz (High) (30 – 15,000 Hz ± 3 dB) 20 – 17,000 Hz (Metal) (30 – 16,000 Hz ± 3 dB)
S/N Ratio:	Dolby NR off 58 dB (metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B NR. A noise reduction of 20 dB at 5 kHz is possible with Dolby C NR.
Motors:	DC servo motor × 2
Heads:	REC/PB:1 PB: 1 ERASE:1
Dimensions:	275 (W) × 118 (H) × 302 (D) mm 10-13/16" × 4-5/8" × 11-7/8"
Mass:	3.0 kg (6.6 lbs.)

Graphic equalizer EQ-32

Total harmonic distortion:	Less than 0.05 % at 20 Hz - 20kHz, 1.5 V output (FLAT)
Signal to noise ratio:	100 dB, 1.5 V output, IHF-A input short
Adjustable range:	± 12 dB
Gain:	0 dB
Power supply:	European model AC 230 V, 50 Hz Worldwide models AC 120 and 220 V switchable, 50/60 Hz
Dimensions:	275 (W) × 79 (H) × 302 (D) mm 10-13/16" × 3-1/8" × 11-7/8"
Mass:	2.5 kg (5.5 lbs.)

Remote control RC-271S

Transmitter:	Infrared
Signal range:	Approx. 5 meters (16 ft. 4")
Power supply:	Two "AA" batteries (1.5 V × 2)

Speaker system PS-32

Type:	2-Way, Bass Reflex
Speakers	
Woofers:	15 cm Cone type
Tweeters:	7 cm Cone type
Impedance:	6 ohms
Max. Input Power:	80 W
Frequency Range:	40 Hz – 20 kHz
Output sound pressure level:	90 dB
Dimensions:	206 (W) × 394 (H) × 291 (D) mm (8-1/8" × 15-1/2" × 11-7/16")
Mass:	5.3 kg (11.7 lbs.)

Speaker system PS-22

Type:	2-Way, Bass Reflex
Speakers	
Woofers:	15 cm Cone type
Tweeters:	7 cm Cone type
Impedance:	6 ohms
Max. Input Power:	80 W
Frequency Range:	48 Hz – 20 kHz
Output sound pressure level:	89 dB
Dimensions:	182 (W) × 315 (H) × 221 (D) mm (7-3/16" × 12-3/8" × 8-11/16")
Mass:	3.3 kg (7.3 lbs.)

Design and specifications are subject to change without prior notice.

ONKYO CORPORATION

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